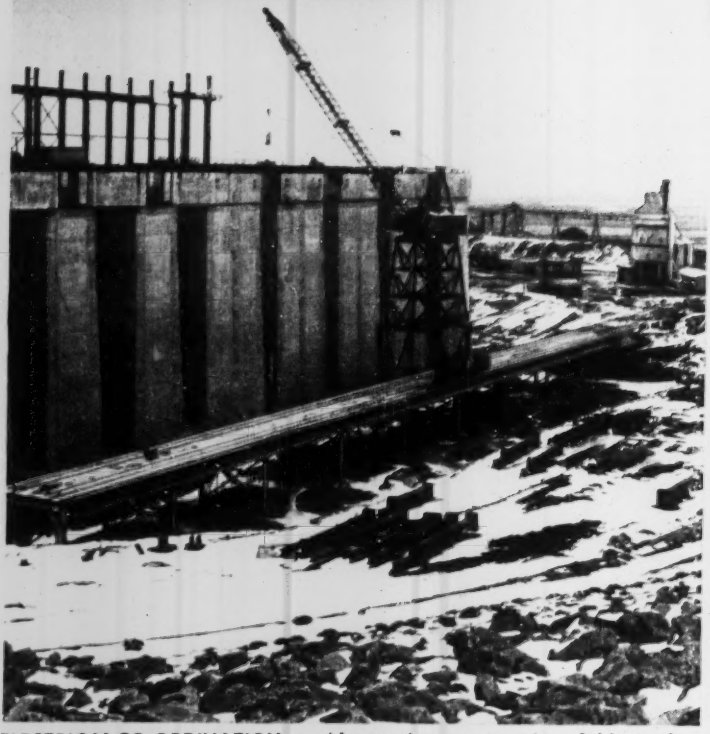
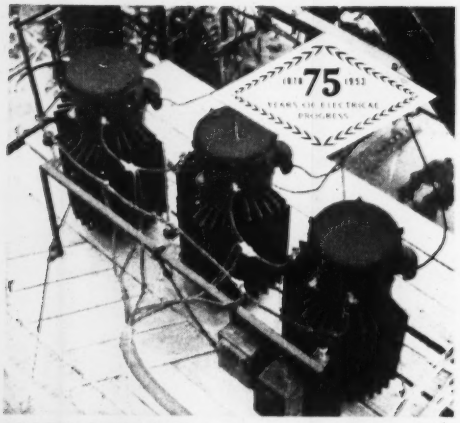
ENGINEERING NEWS-RECORD

A McGRAW HILL PUBLICATION

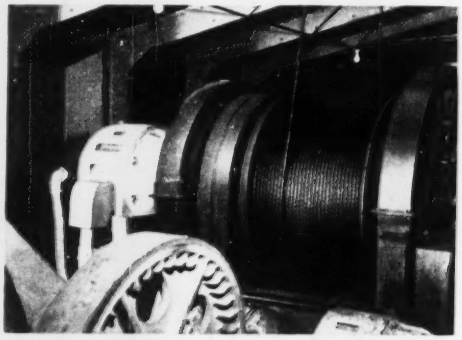
ENGINEERING REPORTS:



ELECTRICAL CO-ORDINATION provides continuous operation of this revolver crane 100 feet above the base of the huge intake structure. Movement along trestle is powered by a G-E 200-hp Type MR motor at foot of the gantry.



ADEQUATE POWER to maintain smooth, dependable crane performance is stepped down by these portable G-E transformers.



RELIABLE DRIVES must stand exacting demands of this revolver crane. G-E 200-hp motors and control are key to this application.

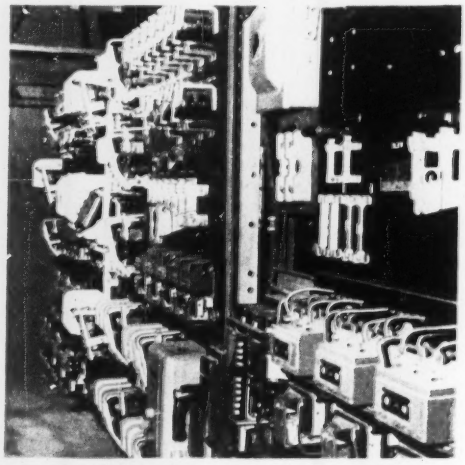
Electricity helps Garrison Dam keep round-the-clock schedule

G-E drives, still on the job after six years, are helping to harness Missouri River

At Garrison Dam near Bismarck, N. D., completely electrified equipment plays a vital role in keeping round-the-clock construction work on schedule. All electrical systems for the project's main stages were designed and co-ordinated by U. S. engineers, Peter Kiewit and Son Co., and Morrison-Knudsen Co. contractors—aided by G-E application engineering. This engineering teamwork resulted in maximum working capacity and fast, smooth operation.

Let G-E application engineers help *you* get the most from your construction equipment through electrification—from the smallest drive to the largest power distribution system. Contact your nearest G-E Apparatus Sales Office. General Electric Co., Schenectady 5, New York.

664-31



CENTRALIZED CONTROL equipment on this compact G-E panel is mounted in the cab for simple one-man operation.

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC

Wire Rope at Work—Some of the world's most beautiful marble comes from the eighteen quarries of the Georgia Marble Company. Through the years this firm has removed and marketed over 30,000,000 cu ft of the durable crystalline stone, which can be seen in famed buildings and memorials in every state of the Union.

The block shown in the picture, a dozen tons of particularly fine white marble, was photographed emerging from one of the company quarries near Tate, Ga. This handling job involved a lift of 175 ft, and the hoisting was done by a stiffleg derrick equipped with sound, dependable Bethlehem wire rope. Here, as always, the Bethlehem rope met every demand with plenty to spare, for it is a product made to take such loads in stride.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

MINING • CONSTRUCTION • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

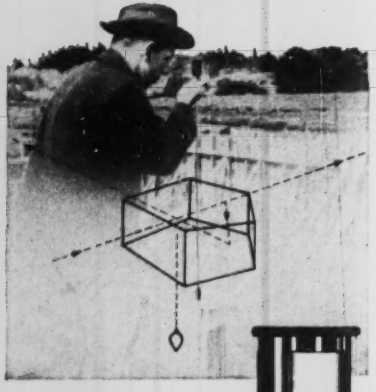
BETHLEHEM WIRE ROPE

BETHLEHEM STEEL

FOR THE "RIGHT" ANGLES USE

WILD HEERBRUGG

OPTICAL SQUARES THE "WATCH POCKET" TRANSITS



WILD Optical Squares, tiny surveying instruments containing pentagonal prisms, will do the complete job of laying out and checking buildings, concrete forms, ditches, pole lines, boundaries, etc., as well as cross sections and topo maps.

These handy tools actually fit your watch-pocket. They require no field adjustment and little or no practice for use.

Single Pentagonal Prisms $19.00
Double Pentagonal Prisms $26.25
Plumbing Rod (Optional) $26.25
(Plus Postage)

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ENGINEERING NEWS-RECORD

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Robert F. Boger

Publisher

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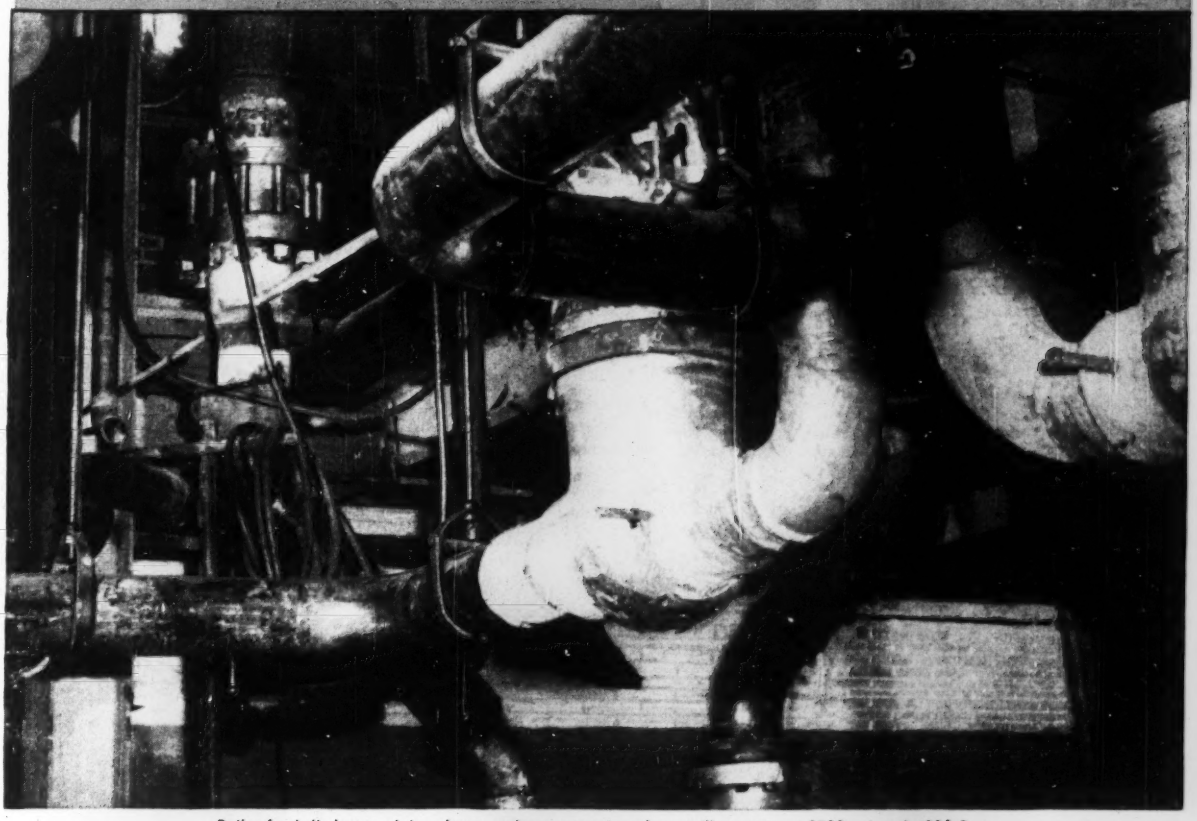
STRONGER THAN PIPE



Boiler feed discharge piping shown under construction above will operate at 2700 psi and 430° F.

Grinnell Welding Fittings

exceed bursting strength of seamless pipe

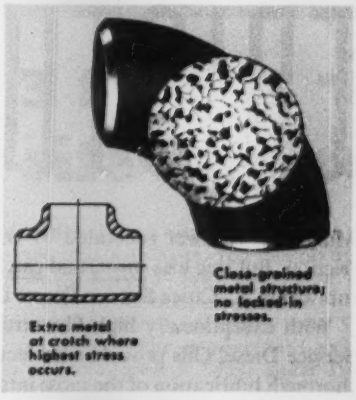
Grinnell Welding Fittings are designed and processed to have a bursting strength greater than the calculated bursting strength of the seamless pipe to which they are to be welded.

Welding elbows and bends are made from seamless steel pipe by a forging process which produces uniform wall thickness at all points; there is no thinning of outer wall.

Welding tees and crosses are made from seamless pipe by a drawing process which provides extra metal and protection at the crotch, where highest stress occurs.

All Grinnell Welding Fittings are process stress-relieved, thus improving grain structure and increasing the strength of the metal.

With all Grinnell Welding Fittings, you get true circularity; smooth, clean inside surface; full, effective radius; easy, sweeping turns; accurate bevels; and true included angles. Available in a wide range of types and sizes, metals and alloys. Send for descriptive catalog.

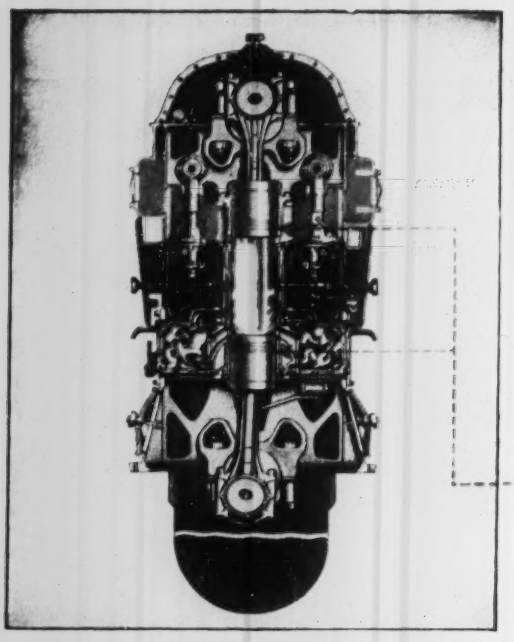


GRINNELL

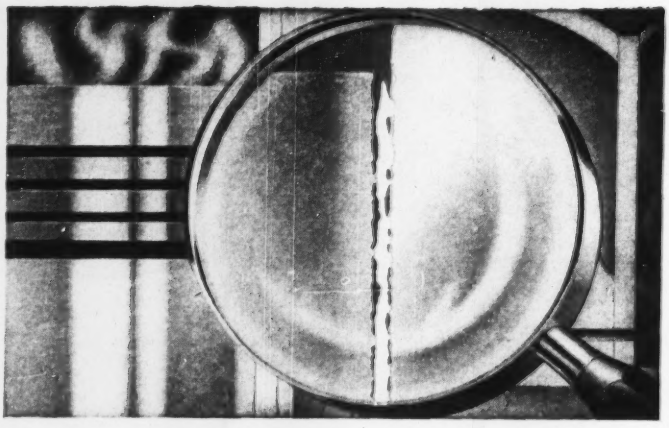
WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

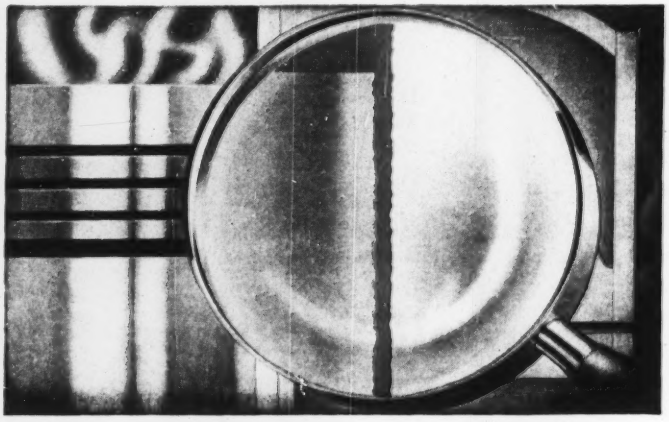


←That demon friction... not only at the points indicated here, but with all moving parts throughout any engine . . . can steal up to 50% of the power produced by your fuel.



↑ *Drawing above* illustrates how inferior diesel oils . . . oils with weak film strength and less free-flowing qualities . . . provide insufficient lubrication and set up friction points.

↓ *Shown below* is the complete coverage Cities Service D-C Oils provide. They provide a strong, adequate oil film, a positive seal between piston rings and cylinder walls.



POWER LOSS DUE TO FRICTION must be held to a minimum

Much of the power generated by any motor fuel is wasted in overcoming friction. But this loss must, and can be held to a minimum with the proper lubricants . . . Cities Service Diesel Lubricants.

With exceptionally high film-strength and free-flowing qualities, Cities Service Diesel Oils provide a perfect oil film between all moving parts and thorough lubrication of the most intricate diesel mechanisms under severest operating conditions. They reduce power-stealing friction to the barest minimum.

Be sure you're getting all the power your diesels were designed to give. Use the complete line of Cities Service D-C Oils. Ask your Cities Service Representative, or call the office nearest you.

CITIES SERVICE DIESEL OILS ALSO:

- **Minimize wear under all conditions.**
- **Provide a positive seal between piston rings and cylinder walls.**
- **Serve as a coolant to fight heat.**
- **Clean as they lubricate.**

CITIES SERVICE

B.F.Goodrich

Tires recapped 2 and 3 times after rugged construction-site service

THE Corvallis Sand & Gravel Company processes rock into ready-mixed concrete, concrete block, drainage tile and other building materials. This Oregon firm transports its products to construction sites, operates construction machinery on excavating, grading and bulldozing jobs.

Tires take a terrific beating. Tire costs can skyrocket. Yet Corvallis reports that even after this rugged work, its B. F. Goodrich Rock tires can be recapped two and three times!

One reason for such outstanding tire performance is the patented BFG nylon shock shield. Layers of strong, nylon cords under the tread of B. F. Goodrich off-the-road tires stretch together to protect the tire body from smashing road shocks. This nylon shock shield gives you a 4-way saving: (1) more original hours of service (2) more recappable tires and more hours of service per recap (3) increased bruise resistance (4) less danger of tread separation. You pay nothing extra for this exclusive B. F. Goodrich feature.

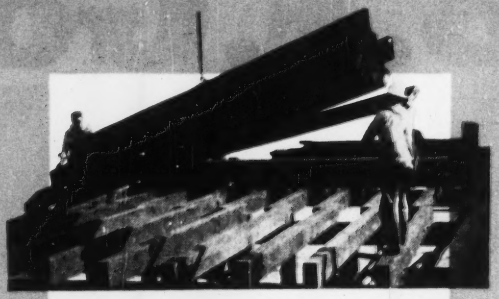
And BFG Rock tires (above) have a specially-compounded tread that defies rock cuts and snags. The non-directional tread grips in forward or reverse, resists slippage. You lose no time rescuing bogged-down equipment.

B. F. Goodrich off-the-road tires give longer service at lower cost. See the complete line at your BFG retailer's. The address is listed under Tires in the Yellow Pages of your phone book. *The B. F. Goodrich Company, Tire and Equipment Division, Akron 18, Ohio.*

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

Specify B. F. Goodrich tires when ordering new equipment

Wood Construction Designed for Permanence



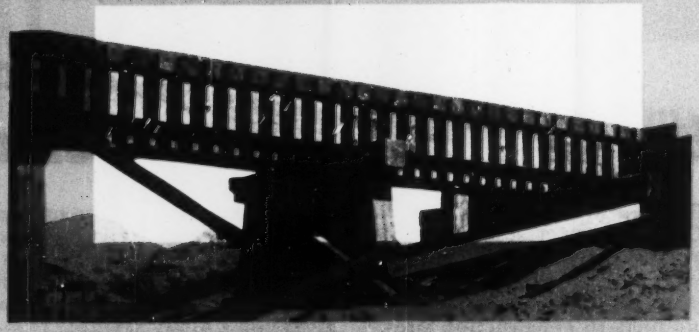
(Official photo—U. S. Navy)

1. **Navy Pier, San Diego.** Rotted stringers and wales were replaced with wood pressure-treated to a 6# retention of Monsanto Penta. This preservative will extend the service life of the wood 3 to 5 times.

2. **U. S. Army Chlorine Plant.** At Muscle Shoals, Alabama, 281,000 board feet of wood for platforms, stairs and railings were pressure-treated with Monsanto Penta. The material was used in the cell room, and around acid drying towers, brine system, etc.

3. **Air Force Bridges.** At Beale AF Base, California, railroad trestle bridges were pressure-treated with a 5% Penta-in-oil solution to an 8# net retention per cubic foot of wood. Penta protects the wood against rot and insect attack.

SEND *for this useful booklet, "Specify Monsanto Penta." Write: Monsanto Chemical Company, Organic Chemicals Division, 800 North Twelfth Boulevard., St. Louis 1, Missouri.*



Monsanto PENTA is Specified for Tough Government Jobs

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CHEMICALS – PLASTICS

SERVING INDUSTRY...
WHICH SERVES MANKIND

MUELLER®

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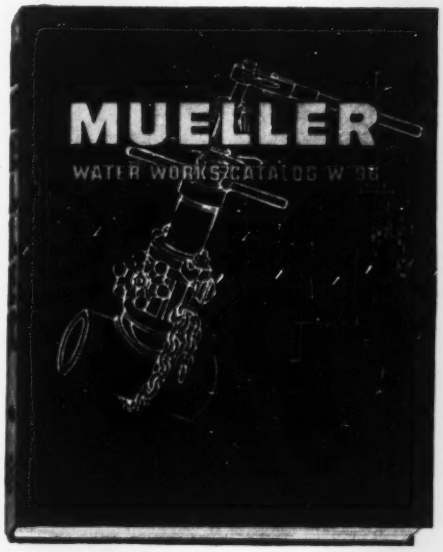

The new Mueller Water Works Catalog is now off the press and its distribution has almost been completed. If you have not received your copy, please drop us a note — Dept. A-36, Mueller Co., Decatur, Illinois.

Catalog W-96 . . . 328 pages . . . the complete line of Mueller Water Works Distribution Products and useful engineering information.

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MAIN OFFICE & FACTORY DECATUR, ILLINOIS

Follow these recommendations to get long-lasting wire rope

On this equipment . . .	*Use this Tiger Brand Rope . . .*	*To do this job.*
Locomotive, Truck, and Crawler Cranes	6 x 25 Filler Wire (6 x 19 Type N) Regular Lay Monitor Improved Plow Steel Excellay Preformed with fiber core. (Use independent wire rope core when rope is subjected to crushing on drum.)	Hoist Ropes (Multiple pa reeving or single part reev ing with tag lines). Holding and Closing Line
	6 x 25 Filler Wire (6 x 19 Type N) Regular Lay Monitor Improved Plow Steel Excellay Preformed with independent wire rope core.	Boom Hoist Rope.
	8 x 19 Regular Lay Plow Steel Excellay Preformed with fiber core.	Tag Lines.
Lift Trucks and Tractors	6 x 19 Regular Lay Monitor Improved Plow Steel Excellay Preformed with fiber core.	Hoist Ropes (when smalle than $\frac{1}{2}$").
	6 x 25 Filler Wire (6 x 19 Type N) Regular Lay Monitor Improved Plow Steel Excellay Preformed with fiber core.	Hoist Ropes (when $\frac{1}{2}$" or larger).
Shop Hoists ($\frac{1}{4}$ ton to 2 ton capacity).	6 x 19 Regular Lay Monitor Improved Plow Steel Excellay Preformed with fiber core.	Hoist Ropes.
Skip Hoists	6 x 25 Filler Wire (6 x 19 Type N) Regular Lay Monitor Improved Plow Steel Excellay Preformed with fiber core.	Hoist and Counterweight Ropes.
Overhead Traveling Cranes	6 x 43 Filler Wire (6 x 37 Type S) Regular Lay Monitor Improved Plow Steel with fiber core. Use independent wire rope core when rope is subjected to heat.	Main Hoist and Auxiliar Hoist Ropes.
Guy Lines	7-wire or 19-wire Galvanized Amerstrand. (Size and grade are dependent on loading.)	Guy Strands
	7 x 7 Regular Lay Galvanized Bridge Rope.	Guy Ropes ($\frac{3}{4}$" to 1")
	6 x 7 Regular Lay Galvanized Bridge Rope with independent wire rope core.	Guy Ropes ($1\frac{1}{8}$" to $1\frac{1}{2}$")
	6 x 19 Regular Lay Galvanized Bridge Rope with independent wire rope core.	Guy Ropes ($1\frac{5}{8}$" to 3")

These recommendations assure safe, economical rope service on most equipment of the types listed. Bear in mind, though, that special operating conditions on your equipment may require a different type of rope. To be sure of getting the right rope, always consult an experienced American Wire Rope Engineer before making your final choice. You can get this free service at any American Steel & Wire Sales office.

10 ways to increase the life of wire rope

1.

GET THE RIGHT ROPE. Carefully examine the operating requirements for your rope, determine how heavy the loads will be, how much abrasive wear, distortion, or crushing the rope must withstand, and how flexible it must be. Then choose the Tiger Brand Wire Rope that has the properties you need . . . there is one for every type of job.

2.

UNREELING. To prevent kinking, be sure the reel or coil is free to rotate as the rope unwinds. Mount reels on an unreeling stand or on a shaft supported by two jacks. Otherwise, hold the rope end and roll the reel along the ground to unwind the rope. Always use this latter method for coils.

3.

SHEAVES AND DRUMS. Align all sheaves. Be sure that sheaves and drums are free to rotate and large enough in diameter to prevent sharp bending. Grooves must be slightly larger than the rope diameter and, if scored or badly worn, should be reground before new ropes are installed. Sheaves with broken flanges should be replaced immediately.

4.

WIRE ROPE FITTINGS. Install Sockets, Clips, Swaged Fittings or Spliced Loops or Thimbles depending upon service requirements. Tige: Wire Rope Sockets properly attached with molten zinc develop the full strength of the wire rope.

5.

SEIZINGS. To prevent untwisting, apply seizings to the ends of any non-preformed wire rope that is not attached to permanent fittings. When you cut a non-preformed wire rope, apply seizings on both sides of the cut to prevent distortion.

6.

LUBRICATION. Lubricate your ropes regularly with Tiger Lube Wire Rope Lubricant to cut down internal wear and reduce corrosion. Where extremely corrosive conditions exist, you may need the extra corrosion resistance of Amgal, galvanized or stainless steel Tiger Brand Ropes.

7.

CUTTING BACK. It is often advisable to change the position of a rope on sheaves and drums by cutting short lengths of rope from the drum end. This distributes wear more evenly, prevents fatigue from concentrating at any one section of the rope, and increases rope life. If you plan to cut back, order your ropes a little longer than normally required.

8.

REVERSE ENDS. Reversing a rope, end for end, will increase its life if half of it gets most of the wear. Reversing distributes wear and fatigue evenly throughout the rope.

9.

STORING WIRE ROPES. If you take a rope out of service for any length of time, clean and lubricate it thoroughly. Then store it in a dry place, protected from the weather.

10.

WHEN IN DOUBT. If you need help in selecting the right rope or in setting up good maintenance procedures, call in an American Wire Rope Engineer. He can give you expert advice on any wire rope problem. Just call our nearest sales office.

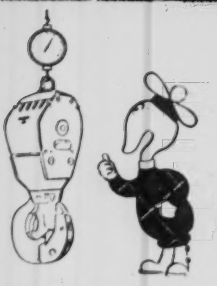
AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL



"Weigh the evidence—and you'll select McKISSICK!"

McKISSICK
CONSTRUCTION BLOCKS
Can Carry the Weight

CUT wire line costs and sheave replacements . . . with flame-hardened, alloy steel sheaves.

REDUCE friction losses, pin and bearing replacements with extra large center pins and bearing assemblies.

ELIMINATE slow wabbling falls . . . by extra weight and balance.

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READER COMMENT

Reinforced pavements

SIR: We were very much interested in the article "Wire Mesh Bituminous Pavement Tested," (ENR Nov. 5, p. 27).

Our interest stems from our own experience in this particular field, for it was in the late fall of 1937 that the Michigan State Highway Department, at our suggestion, resurfaced a portion of State Trunk Line M-21 between Holland and Grand Rapids with reinforced bituminous concrete, using expanded mesh reinforcement directly over the badly broken and distorted concrete pavement.

The Michigan experimental resurfacing was a success as demonstrated by nine years of satisfactory service before a resurfacing was required. An illustrated report of the Michigan experiment appeared in the Report of the Maintenance Section—1937—Division of Construction, U. S. Bureau of Public Roads.

Since the use of mesh reinforcement in connection with bituminous concrete surfaces is receiving serious consideration by highway engineers, we though you might be interested in our early experience in Michigan.

L. P. SCOTT
District Engineer,
Bureau of Public Roads,
Lansing, Mich.

Sprinkler costs being cut

SIR: Our attention has been directed to an editorial which appeared in your Oct. 15 issue entitled, "Fire Safety Responsibility." It referred to the lessons learned from the fire that destroyed the hydramatic transmission plant of the General Motors Corp. in Livonia, Mich. Our particular concern is over the statement "that outlay for 100% coverage with a sprinkler system is too great."

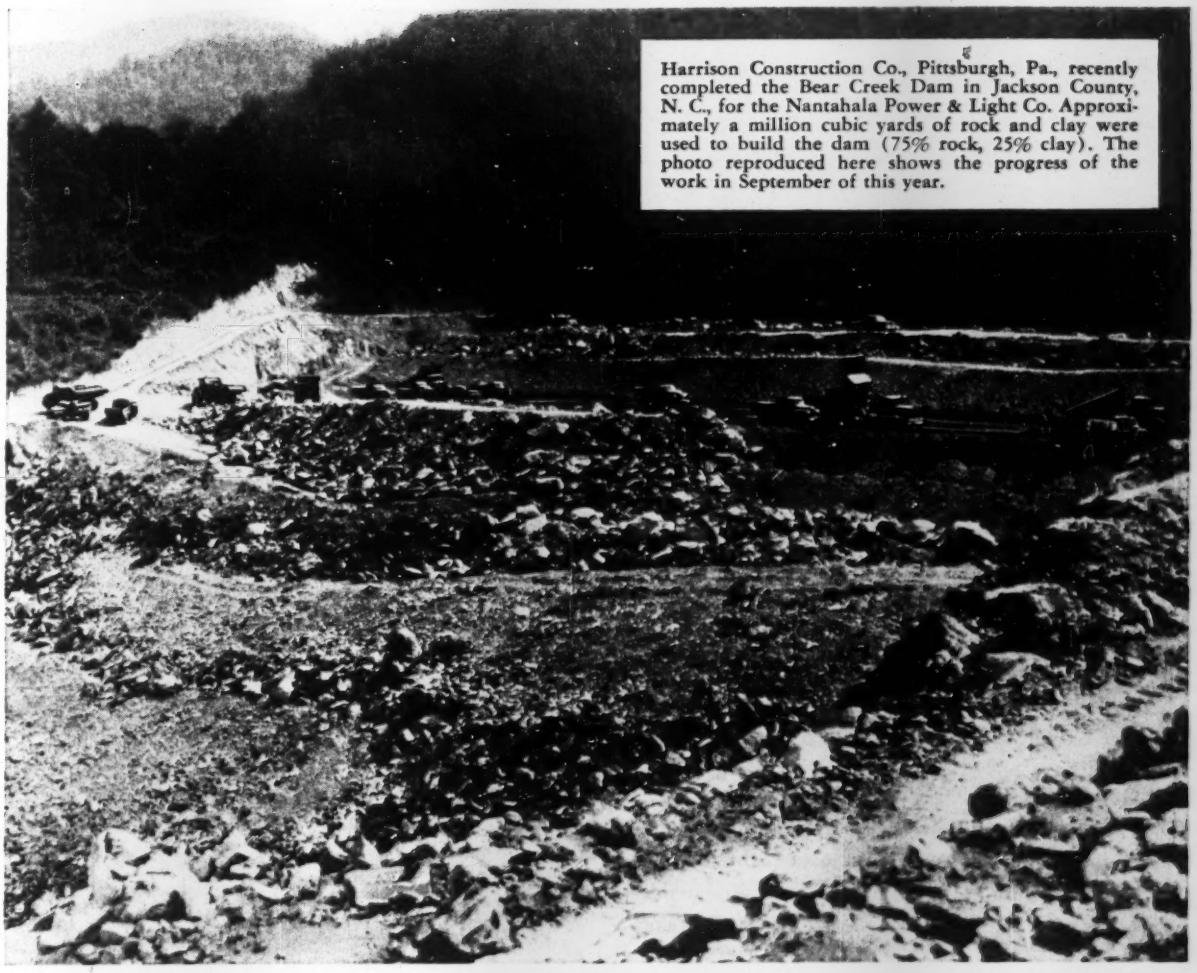
Since this observation was published, you, no doubt, have seen or read about the report issued by the Factory Insurance Association, which recommended that similar plants be completely sprinklered as a prerequisite to fire safety. Other national organizations in the insurance field have reached the same conclusion. For more specific data, we refer you to the first article in both the October and November issues of our monthly News Bulletin. Also the fact must not be lost sight of that if the Livonia plant had had 100% automatic sprinkler protection, the cost of such an installa-

(*Continued on page 14*)

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on North Carolina Dam Project



Harrison Construction Co., Pittsburgh, Pa., recently completed the Bear Creek Dam in Jackson County, N. C., for the Nantahala Power & Light Co. Approximately a million cubic yards of rock and clay were used to build the dam (75% rock, 25% clay). The photo reproduced here shows the progress of the work in September of this year.

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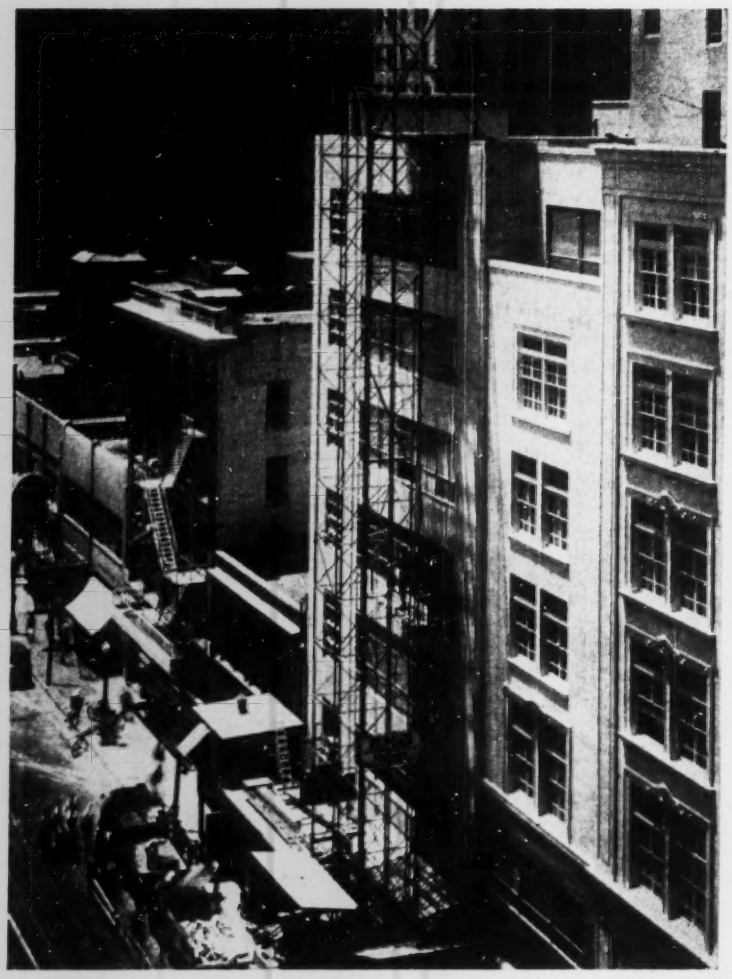

Clyde Hoist Speeds Construction on World Famous Store

Fast, safe handling of building materials and supplies play an important part in construction schedules. The Neiman Marcus project in Dallas, Texas, was no exception. To stay ahead of schedule, to lower building costs and to keep materials moving swiftly and economically, the Henger Construction Company used a Clyde double drum gasoline hoist to handle all supplies on the construction of this sumptuous home for a world famous fashion center.

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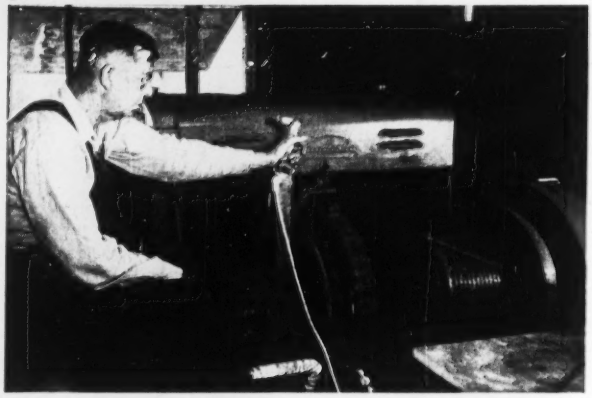
No matter what size Clyde Hoist fits your requirements, you will find a Clyde is fatigue-free in operation. This makes for greater safety on the job . . permits the precision spotting of more loads with substantial savings in time and money.



"Very satisfactory" is the comment made on the performance of this Clyde Hoist. It has operated almost constantly on job after job ever since it was purchased.

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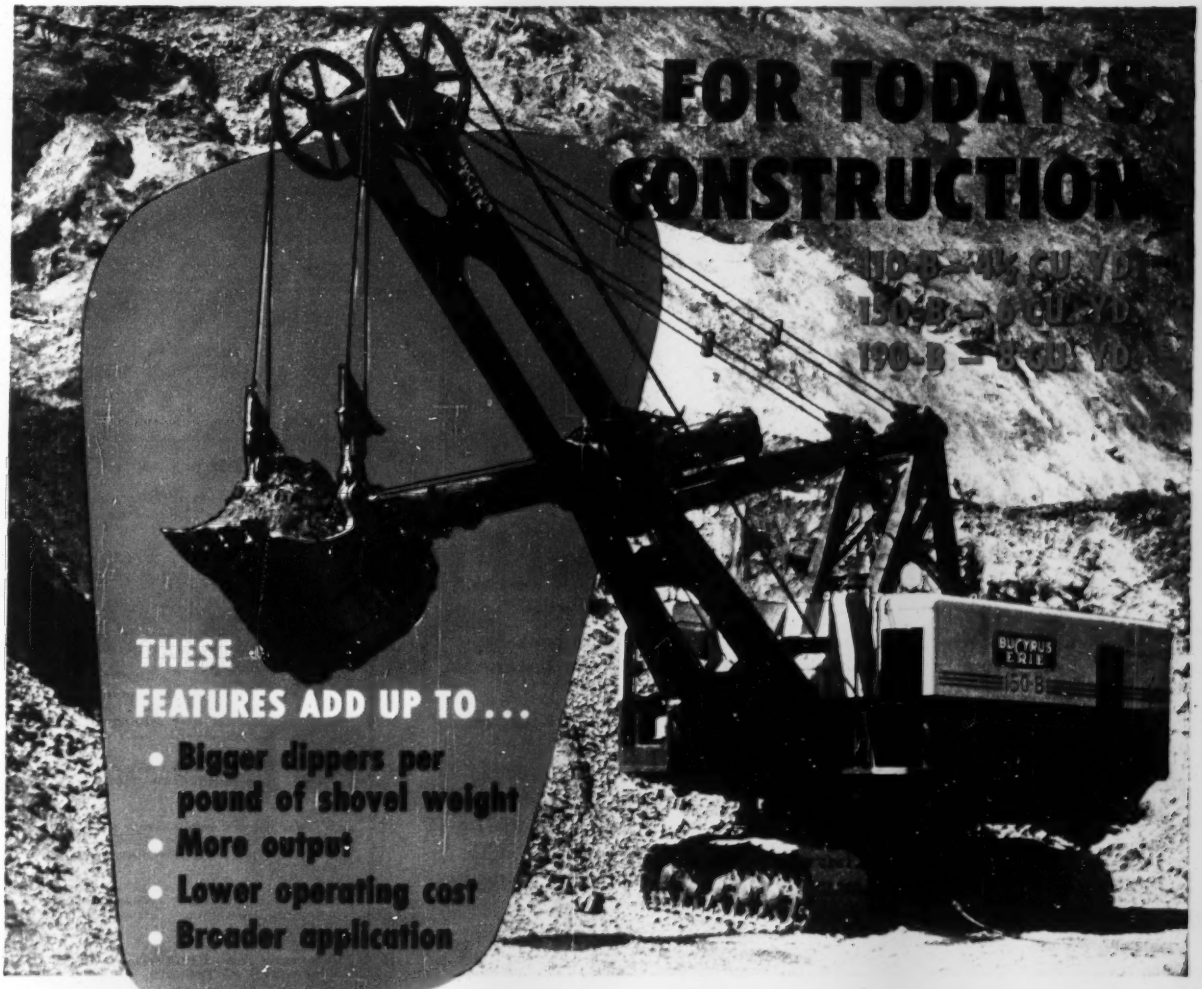

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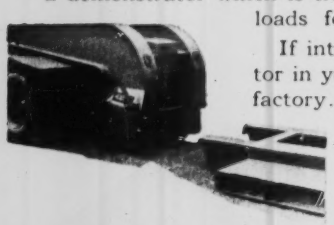

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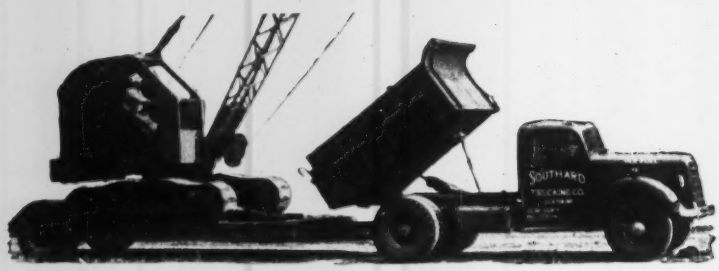


Attaching of loaded Rogers Tagalong trailer

READER COMMENT

tion would have been only a small fraction of the $50-million dollar loss.

The sprinkler industry is constantly aware of the necessity for reducing the cost of its equipment to a minimum, and has a special committee which is continually studying ways and means of achieving this. A substantial decrease was recently accomplished in the introduction of the automatic spray sprinkler. Further economies also will be effected in their installation as provided for in revised insurance standards.

A. D. Bosch
Secretary
Nat'l Automatic Sprinkler and Fire Control Association
New York, N. Y.

CALENDAR

American Road Builders Association, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., Jan. 5-7.

National Constructors Association, annual meeting, Hotel Commodore, N. Y. City, Jan. 12-14.

Highway Research Board, annual meeting, National Academy of Sciences Building, Washington, D. C., Jan. 12-15.

National Association of Home Builders, annual convention and exposition, Conrad Hilton and Sherman hotels, Chicago, Jan. 17-21.

N. Y. Section AWWA, winter luncheon meeting, Commodore Hotel, N. Y. City, Jan. 19.

Land surveyors conference and exhibition, University Commons, Rutgers University, New Brunswick, N. J., Jan. 23.

Mason Contractors Association of America, Sherman Hotel, Chicago, Jan. 24-27.

Conference on Prestressed Concrete, University of Toronto, Toronto, Ont., Jan. 28-29.

Associated Equipment Distributors, Waldorf Astoria Hotel, N. Y. City, Jan. 31-Feb. 4.

Association of Asphalt Paving Technologists, Kentucky Hotel, Louisville, Ky., Feb. 1-3.

Ohio Water Clinic Conference, Ohio State University, Columbus, Feb. 11-12.

California Industrial Safety Conference, Palace Hotel, San Francisco, Feb. 11-12.

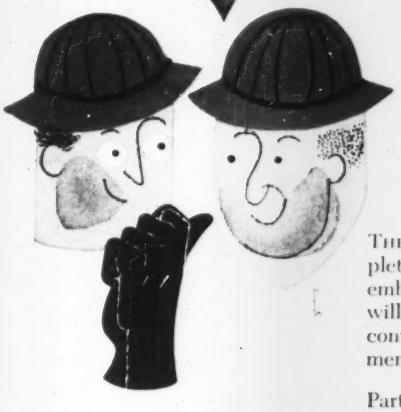
N. J. section American Water Works Association, winter meeting, Essex House, Newark, N. J., Feb. 16.

Northwest conference on road building, University of Washington, Seattle, Feb. 17-19.

Golden Anniversary Convention, American Concrete Institute, Shirley-Savoy Hotel, Denver, Colo., Feb. 22-25.

American Concrete Agricultural Pipe Association, Fairmont Hotel, San Francisco, Calif., Feb. 24.

American Concrete Pipe Association, annual convention, Fairmont Hotel, San Francisco, Calif., Feb. 25-27.



they're using CRUCIBLE HOLLOW DRILL RODS at FOLSOM DAM

THE FOLSOM DAM project is a big construction job. When completed it will be 340 feet high, 1400 feet long – with wing embankments extending for more than two miles. The new dam will provide a source for irrigation and power, and serve to control flood conditions in the American River Basin near Sacramento, California.

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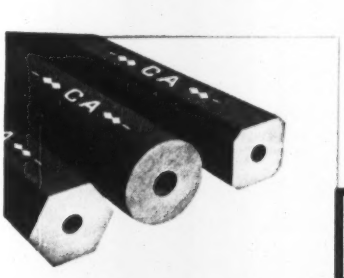

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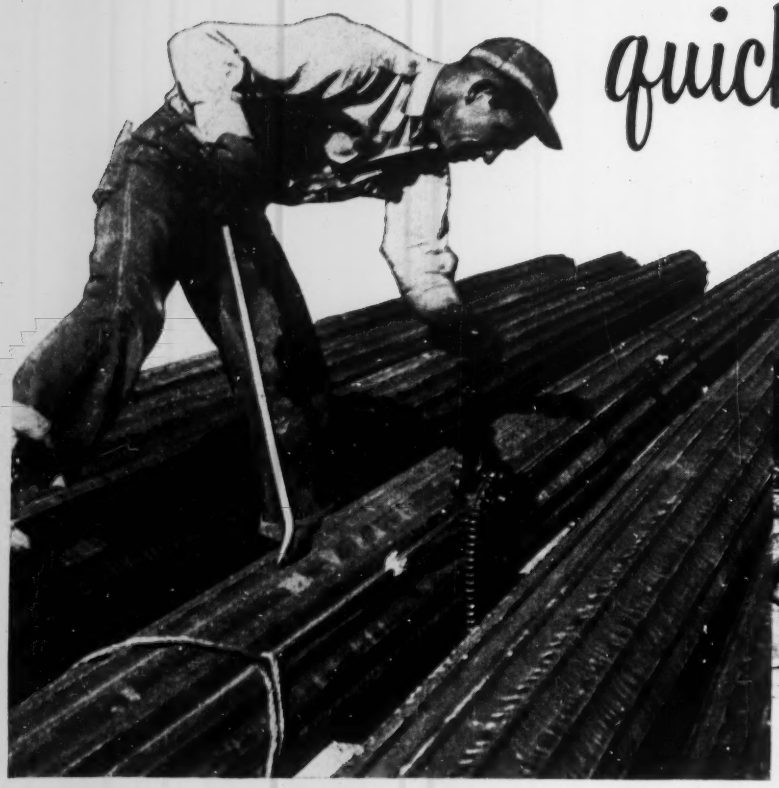

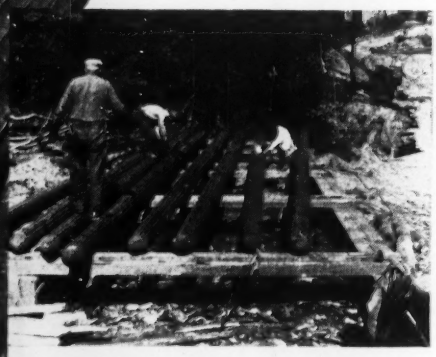

Above: Speedy nesting and welding operations on an assembly rack in the field. Tailoring piles to the required length, on the job, minimizes cut-off waste.

HERE, on a typical job, you can see the simplicity of extending Monotube piles in the field. In the photo above, a Monotube extension is being nested with a "come-along" and two cable chokers. On the same rack, as shown at right, a welder completes the job. The operation is fast . . . and sure!

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Overall view of foundation work for new bridge showing storage yard, pile assembly rack at left, and driving operation in background.

UNION METAL

Monotube Foundation Piles

Vol. 151 No. 26

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THE CONSTRUCTION WEEK

ATOM WORK—Just how much construction would be involved is still guesswork, but the industry would do well to watch that proposal by seven Midwest universities to get together on a $30-million atomic energy research project. The work—for which the University of Illinois already has set aside $10,000 for organization expense—envisages construction of a multi-million-volt cosmotron (and the buildings to house it and appurtenant works) to accelerate electrons to hitherto unreached speeds. Bulk of the money would have to come from Atomic Energy Commission funds.

AIRPORTS—DO IT YOURSELF—The red tape and bother entailed in federal grants just isn't worth it—so Wisconsin is satisfied to build its own airports, with its own funds. State Aeronautics Commissioners faced with equanimity the fact that the state has had no federal money for airport projects during the current fiscal year and may not have any for next year.

Said T. K. Jordan, commission director: Except for very large projects, federal aid caused delays and hampered efficient work; many communities favor going ahead with state and local funds.

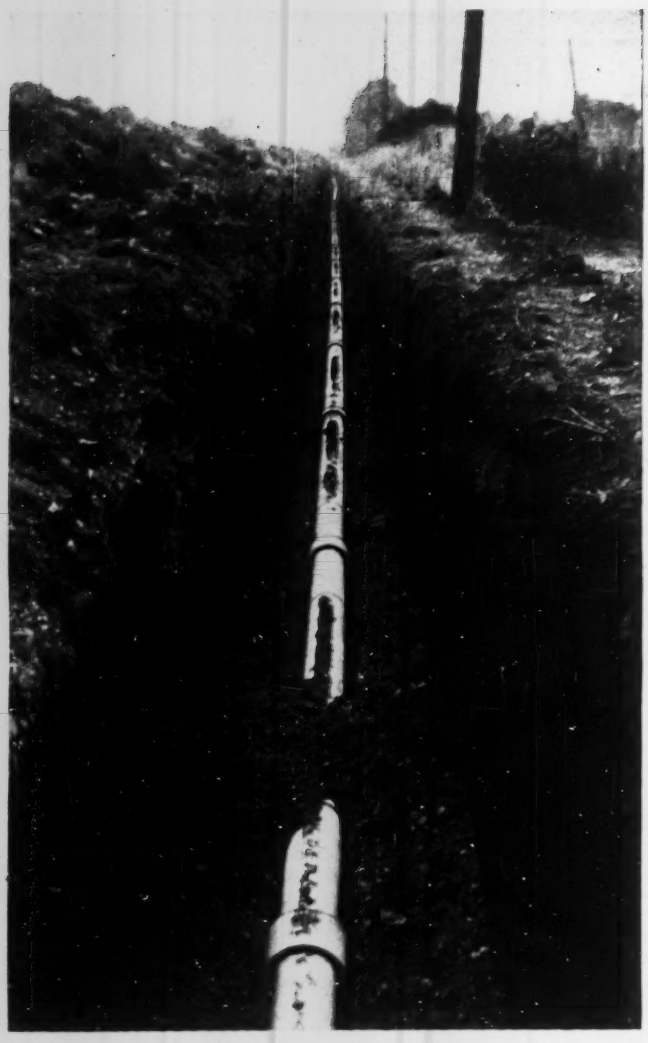
CLEANOUT—If anyone has been getting worried about how close current Communists-in-government investigations are getting to agencies that affect the construction figures, he might consider these statements from Interior Undersecretary Ralph Tudor:

There have been "allegations" concerning the loyalty of some 300 individuals in the Interior Department—these allegations were in department files when the new Administration took over. Of these 300 persons, 83 have been separated from the service or have resigned. It should be remembered in fairness, Tudor added, that "a few" of the 83 resigned before any adjudication of the charges against them, and may have resigned for purely personal reasons.

SECURITY UPGRADE—With the "restricted" classification on government documents out the window (as of Dec. 15) a lot of upgrading—to "confidential"—is due. And that'll pose a lot of paperwork problems for contractors who handle huge rolls of blueprints and directives on federal and private-industry defense work.

What it'll mean is this: Contractors are going to have to make more careful provisions for handling such matter than were needed up to now; some employees may have to be upgraded (in classification) also, and thus may have to be investigated some more; special provisions will have to be made about mailing and destruction of such documents.

New regulations aren't likely to be final before Jan. 15—and shortly thereafter, a new industrial security manual is promised, to give complete instructions.



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WASHINGTON OBSERVER

Congress will be acting next session on a succession of laws that automatically expire or change. It's a good time, with the new program from the White House now being worked out, to keep in mind the timetable on laws affecting construction:

1. The Social Security tax goes up to 2% on employers and workers on Jan. 1, (Congress may freeze the present 1½% tax retroactively).

2. The Korea-increased gasoline tax expires April 1, along with a whole series of excises that raise $800 million.

3. Rent control in defense areas ends April 30. (Probably it won't be extended.)

4. Veterans' preference rights for new purchase and rental housing expires April 30. (Some kind of extension will be voted.)

5. Import duties on copper, suspended during the mobilization, will expire. (The high tariff bloc will press to see that they stick.)

6. Authority of General Services Administration to conduct negotiated sales of surplus property must be extended beyond June 30.

7. Title III of the Housing Act expires June 30 covering most financing aids of the federal government in defense housing, secondary mortgages.

8. Defense facilities construction authority expires July 1.

•

An atom power plant study by the Tennessee Valley Authority primarily will bolster the utility engineer staffs already at work under the Westinghouse contract building a nuclear power plant.

Location of the Westinghouse construction also is involved. Sen. Estes Kefauver of Tennessee, up for re-election, already is pushing to have the 60,000-kw plant near the Oak Ridge atom site. Awarding of the TVA study improves the chances, he thinks.

•

Two design and construction divisions are being created in a reorganization of Interior's National Park Service—one for the West and one for the East. Locations haven't been selected yet, but all such activities now carried on in regional offices will be centered in the new offices. Another feature of the reorganization is giving to states responsibility for maintaining all parkways and roads, except for some unusual cases.

•

Signing of "no-raiding" pact by AFL and CIO chiefs last week is described as a "cease fire." But the paper signed by Meany and Reuther doesn't bind any of the member unions—including those in construction industry—until the individual union chiefs themselves sign on the dotted line.

Big question mark is Dave Beck and his teamsters who have eyes on construction workers Beck thinks should belong to his outfit—carpenters, plumbers, laborers, for instance, who haul materials from materials yards to the job site.

In fact, whole "no raid" pact could fall by the wayside if Beck goes ahead with the big organizing drive he has just launched.

•

Construction of an Air Force academy will be pushed next year. A "West Point" for flying cadets has the backing of the Administration and Chairman Short of the House Armed Services Committee. Short's bill authorizes $10 million for planning and survey work. Actual construction money wouldn't be voted until later. A North Carolina site and locations in the Southwest have been mentioned.

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Code confusion: It hampers wall design

Survey finds building codes differ widely, contain inconsistencies in requirements for skyscraper walls

Frederick S. Merritt
Associate Editor

Lack of clear-cut, uniform building-code requirements for exterior wall panels is hampering use of new materials. Also, excessive fire resistance requirements in some codes add unnecessarily to costs of skyscraper construction. An ENR survey of building codes reveals paradoxes in some of the model codes as well as in some city regulations. Erection of a building with a metal exterior, as has been done in New York and Pittsburgh, for example, is permissible in only a few cities. Some cities will allow metal panels with no fire-resistant backup; others want as much as 8 in. of masonry. The survey also indicates that code writers are aware of the problem. Several recently revised codes evidence attempts at clarifying the regulations for wall panels.

• **Codes differ widely**—In making the survey, ENR asked building officials, "What masonry thickness and fire resistance does your city building code require for the exterior wall of an office building more than six stories high?"

A wide range of answers was received. Examination of some of the model codes indicated that these too, differ.

The National Building Code, recommended by the National Board of Fire Underwriters, for example, requires for both fireproof and semi-fireproof construction that "exterior walls and wall panels shall have a fire resistance rating of not less than four hours."

The Uniform Building Code of the Pacific Coast Building Officials Conference requires 4-hr resistance where there is danger of fire spreading to an adjacent building. But for building sides fronting on wide streets, a panel wall merely need be incombustible.

The basic Building Code of the Building Officials Conference of America specifies fire resistance varying from ¾ hr to 2 hr, depending on the proximity of structures to which fire might spread.

Most of the building officials replied that their regulations required panel walls with 4-hr fire resistance, solid masonry 8 in. thick or reinforced concrete 6 in. thick. In some cases, they specified permissive materials and thicknesses; in others, just the needed fire resistance. Other building officials said that their requirements depended on the proximity of structures to which fire might spread.

• **No objection to glass**—Paradoxically, however, many of these codes permit all, or nearly all, of the building exterior fronting on a wide street to be of glass. In other words, in some cities you can enclose your building in glass if you wish, but if you decide to install on the building exterior an opaque panel of another material, it might have to be 8 in. thick or more.

"Sounds crazy, doesn't it?" observes Ray Cummings, assistant chief building inspector of Dallas.

The National Building Code has a similar inconsistency. While it requires a wall with 4-hr fire resistance on building sides fronting on wide streets, these exterior walls are permitted to be of glass, if the openings are separated vertically by 3-ft-high walls with adequate fire resistance.

This type of inconsistency does not appear in some codes, but in many cases, it is removed by substitution of a restriction on glass area that appears to be excessive by comparison with the requirements of the majority of codes. In those cases, glass area may be limited to as little as 25% of the area of the building exterior.

• **Paradox in fire ratings**—in some codes in which the inconsistency between glass area and fire resistance does not appear, another paradox may be found. If the building fronts on a street wider than, say, 30 ft, the wall may have only a 1-hr fire resistance, or merely be incombustible. But if the code is strictly enforced, the fire-resistance requirement jumps to 2 or 4 hr if the street is a few inches narrower. Such a paradox is contained in the Uniform Building Code.

The more recently written basic building code avoids this situation in a practical manner: Fire ratings are decreased in increments as the distance of the building wall from a property line or adjacent building increases. For Type 1-A construction, for example, fire resistance required is 2 hr when the distance is 0 to 11 ft, 1½ hr when the distance is 11 to

Photo by Cheekman

METAL WALL PANELS for 99 Park Ave., New York, have 4-in. masonry backup. Indicative of building-code confusion, other cities require none.

• • • Building code confusion

30 ft and ¾ hr when the distance is more than 30 ft.

In contrast to this requirement, which was developed only three years ago, a 4-hr fire resistance is required in San Francisco while New York asks only two hr. New Orleans permits incombustible panels of any thickness along streets only 30 ft wide, while Birmingham, Ala., won't permit this unless the street is 50 ft wide.

Whether any of these fire ratings are consistent with actual fire experience was discussed in an article, "Take the waste out of fire protection," in ENR Sept. 1, 1949, p. 162.

Asked if their codes permit metal wall panels for skyscraper exteriors, only a few building officials replied that such panels would be allowed without fire-resistant backup. New Orleans, Boston, Boise and Atlanta are among the cities that will permit such construction, if there is sufficient distance between the wall and property lines or adjacent structures. Most cities permit metal as a veneer only. And a few will not allow metal at all without special permission.

• **Date trouble**—The trouble lies in the fact that many city codes are not kept up to date. A survey made by the National Bureau of Standards a few years ago disclosed that nearly half of all U. S. cities either had no building code at all or were operating under regulations ranging from 20 to 44 years in age, and less than 10% were doing anything about it (ENR Dec. 2, 1948, p. 7). There is no indication that the rate of modernization of codes has increased any since that time.

The 4-hr requirement for exterior wall panels is found consistently in the older codes. When it was set up years ago, almost any wall that would have been structurally satisfactory had a fire resistance of at least 4 hr. Now, thinner, more economical constructions are available with adequate structural capacity and durability but not necessarily with the fire resistance of the older types of construction. The importance of setting logical fire resistance ratings for these new construction materials and methods is, therefore, apparent.

Proponents of Colorado River project hope for speedy action by Congress

House hearings on authorization of the big Upper Colorado River Storage Project will start Jan. 18. Proponents of the project from the five-state area hope to have Senate hearings on the same days—the House in the morning and the Senate in the afternoon.

It is up to Sen. Eugene D. Millikin of Colorado, chairman of the Senate Interior Subcommittee handling the bill, to decide whether concurrent hearings can be held.

Millikin introduced the authorization bill—co-sponsored by the nine other senators from the Upper Basin states—at the last session. Identical legislation was introduced in the House by congressmen representing the Upper Basin area.

With that kind of backing, there is a fair chance that Congress may act at the coming session on the authorization measure. One obstacle could be Budget Bureau delay in clearing the Interior Department's recent recommendations on the project (ENR Dec. 17, p. 19).

But the congressional committees can get all the factual testimony they want from Interior and reclamation experts. These witnesses, however, will have to testify with the reservation that the Budget Bureau has yet to say how the project fits in with the President's program, and bureau decision on this matter may be a long time coming.

Signs point to an exhaustive Budget Bureau study of the project. Results can hardly be expected before the 83rd Congress closes its second session—unless Senator Millikin persuades the White House to push things faster. But, until the Administration gives the green light, the authorization measure probably won't be scheduled for floor action in either house.

Hearings are likely to be stormy. Interior Secretary McKay this month recommended two big storage dams—Glen Canyon and Echo Park—and the Navajo irrigation reservoir for authorization as a first phase of the project. Conservation and wild life groups will line up for a bitter fight against Echo Park reservoir in the Dinosaur National Monument in northeastern Utah.

Colorado interests also are much upset by omissions from published accounts of Secretary McKay's report. Actually, the Secretary told the President and the Budget Bureau that Congress may wish to add Curecanti Dam on the Gunnison River to take care of immediate power and water storage needs in Colorado. But the city of Denver wants a large share of west slope water, and means of supplying that demand are harder to find.

First purpose of the Upper Basin project is to store a sufficient quantity of water to assure delivery to the lower Colorado River of the average annual flow agreed to under the Colorado River Compact. The two storage dams recommended by McKay, with 26,000,000 acre-feet at Glen Canyon and more than 6,000,000 at Echo Park, would be able to take care of this commitment.

With 13 irrigation districts included in the initial phase now proposed by the Interior Department, the construction to be undertaken over the course by several years would cost an estimated $1.1 billion. Any projects added by Congress would increase the estimate. Eliminated from McKay's proposal were two dams recommended by former Secretary Oscar Chapman in 1951 for the initial authorization: Flaming Gorge above Echo Park on the Green River and Whitewater on the Gunnison, some distance downstream from the Curecanti site.

Everett H. Hatch, noted tunnel builder dies at 73

Everett H. Hatch, 73, who built many of the most difficult tunnels during the last 20 years died recently in Oakland, Calif.

Affiliated since 1933 with the Walsh Construction Co., his tunnel jobs include the Colorado River Aqueduct's coopper basin tunnel, the Fort Peck Dam Diversion Tunnels, the Queens Midtown Tunnel in New York City and various tunnels on the city's Delaware aqueduct.

A 1908 graduate of Stanford University, Mr. Hatch began his career with a variety of engineering jobs both in this country and abroad. From 1920-27, he was employed by Pacific Gas & Electric Co. mostly on hydroelectric plants in the Sierra Nevada. Then he worked with the British Columbia Electric Co., in Canada. He joined Walsh Construction Co. in 1933 for the Copper Basin job. His work with Walsh also included defense base construction in Trinidad, British West Indies, shipyard work in Rhode Island and a variety of railroad construction work.

Harvester acquires Heil line of two-wheel tractors

International Harvester Co., Chicago, has arranged to make and distribute the two-wheel, rubber-tired industrial tractors now made and sold by Heil Co., of Milwaukee, for heavy construction work. Heil will supply Harvester with the tractors until Harvester begins manufacturing them.

Lagooning

Ohio communities get OK to try sewage method—with some reservations

Ohio villages—hard pressed, like many others, for money to build sewage works—got a green (and a yellow) light last week on lagooning: perhaps the least expensive method now practiced.

Lagooning involves construction of a shallow pond of even depth, into which wastes are piped for natural treatment by sun and wind (See ENR Aug 20, p. 48). The system has been used successfully in the Dakotas and Montana, where there are ample open spaces.

Ohio Health Director John D. Porterfield issued a statement on the matter that was both permissive and a warning. Said Porterfield:

"The Ohio Department of Health is not going to encourage trials of the lagoon system here. But if some town wants to try it, and can find a qualified engineer to prepare plans for it, we probably would be willing to give approval on a trial basis.

"But if the system fails to work properly after a fair trial, the village trying it might later be required by the Water Pollution Control Board to build a standard type of sewage treatment plant."

The health officer said that the system might not work as well in Ohio as in North Dakota, where lower rainfall and a higher rate of evaporation prevail. Dakota also has more hours of sunshine per year, and strong prevailing winds. All these contribute to the greater effectiveness of the system.

In North Dakota, about 10 acres of lagoon surface is needed for each 1,000 population.

Long mountain tunnel proposal being surveyed

Consulting engineers have begun studying a proposal for a low-level rail and highway route from San Diego, Calif., to the Imperial Valley, involving a 3.4-mi tunnel under the Laguna Mountains. Cost of the proposed toll project is estimated at up to $400 million.

The San Diego County Board of Supervisors awarded the survey contract to the New York firm of Parsons, Brinckerhoff, Hall & Macdonald, with the stipulation that the study is to be terminated if at any point in the investigation it appears that the project is unfeasible.

County officials said a toll authority would be formed to build the project, if the results of financial and engineering surveys are favorable.

Proponents of the project point out that there are only two low-level routes through the mountain barrier into southern California. Both funnel into the Los Angeles metropolitan area.

Illinois '54 road work will cost $84.5 million

Illinois has set up an $84.5-million roadbuilding schedule for next year, including the addition of two lanes to 72 miles of U. S. 66, which will give motorists a modern 150-mi, four-lane expressway from Chenoa in the north to Mt. Olive in the south.

The '54 budget provides for 160 mi of other new road construction, 286 mi of resurfacing, 71 new bridges, 20 grade separations and the widening of 37 other bridges. New roadway construction will include 59 mi. of two-lane, 58 mi of additional lanes and 42 mi of four-lane construction.

The program calls for expenditure of $17.5 million in Cook County.

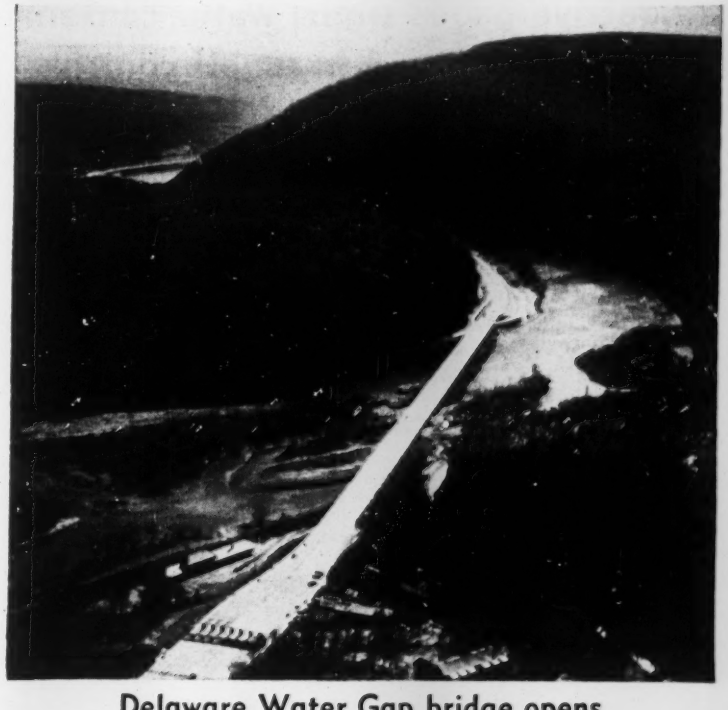
Former W. Va. governor takes turnpike post

West Virginia's former Gov. Okey L. Patte son has been hired by the state's turnpike commission as general manager of the 88-mi toll road under construction between Charleston and Princeton.

Patte son, whose term ended in January of this year, had appointed members of the commission, which named him to the $20,000 per year job. He will assume his duties Feb. 1—about six months prior to the scheduled opening of the turnpike.

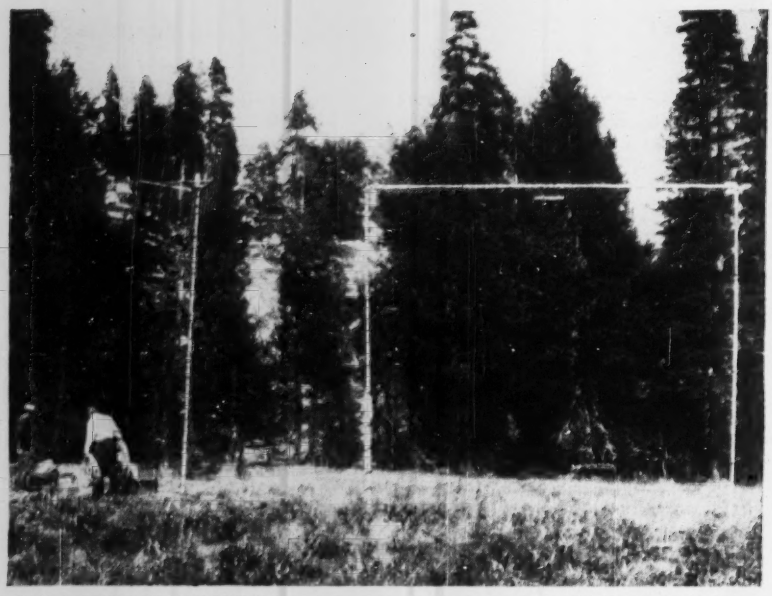
Ray Cavendish, who served as State Road Commissioner under Patte son prior to taking his present job as executive director of the turnpike, will become chief engineer on Feb. 1 at his current salary of $12,000.

Patte son, who had returned to the real estate business in Mt. Hope following his term as governor, is now inspecting turnpike construction projects to acquaint himself with the problems of his new post.



Delaware Water Gap bridge opens

Opened to traffic last week was an $8.2-million dual highway river crossing about a mile downstream from the Delaware Water Gap, linking arterial routes of Pennsylvania and New Jersey. The structure consists of dual bridges, which cross the river at a 28-deg angle. Fifteen piers carry the 2,398-ft upstream bridge and 16 piers carry the 2,461-ft downstream bridge—an extra 63-ft span compensating for the skewed pier arrangement (ENR Sept 10, p. 30). The crossing is a Delaware River Joint Toll Bridge Commission project. Johnson, Drake & Piper, Inc., of New York were prime contractors; J. E. Greiner Co. of Baltimore, the consulting engineers. Steel fabrication and erection was performed by Bethlehem Steel Co.



SNOW GAGING STATION includes gallows frame (at right), which suspends Geiger-Mueller tube over radioactive cobalt in lead pipe set in ground. At left, are data transmitter and antenna.

Radioactive gages signal water content of snow packs as aid in runoff control

The Corps of Engineers has developed a telemetering system that uses radioactive snow gages to bring into a control center daily reports of the water content of remote snow packs.

The system—first of its kind—has been installed in the Kings River watershed on the west slope of California's Sierra Nevada. Runoff from this area next spring will be controlled by the corps' Pine Flat Dam, soon to go into operation.

The telemetering system will transmit indications of the water content of snow pack in two areas to a receiving station above Pine Flat. Signals will be fed into an electronic counter that indicates water content by number of counts per minute. Daily reports over the system will help Pine Flat reservoir operators to make more accurate forecasts of the runoff.

The technique of using radioactive snow gages and the telemetering system was developed at the corps' Central Sierra Snow Investigation Laboratory at Soda Springs, Calif., near famous Donner Summit. Under leadership of R. W. Gerdel, application was made of Lambert's Law regarding intensity of radiation from a radioactive element passing through an absorbing medium—in this case, water.

Radioactive snow gages and the telemetering system will make possible a more accurate method of forecasting spring runoffs by taking into account runoff potential at higher elevations. At present, limited information for forecasts is gathered by several methods and pooled by California's Cooperative Snow Surveys. Monthly data are gathered laboriously from established snow courses by men on skis who measure the water content of snow packs. The trouble with this method is that it is nearly impossible to get to elevations above 9,000 ft.

By use of snow markers and aerial photography, California Electric Power Co. and others have attempted to overcome this altitude limitation. However, this method provides only measurement of depth of snow pack and not water content.

Measuring devices are located high in upper reaches of Kings River watershed. Because rugged terrain rules out direct line-of-sight transmission to Pine Flat, a repeater station is required on 10,050-ft Spanish Mt. to relay signals.

The snow gage consists of a heavy lead tube planted in vertical position flush with ground. In the lower end of the tube, two units (40 millicurries) of cobalt 60 have sufficient strength to penetrate and measure the snow depth equivalent of 55 in. of water. This cobalt retains half life after 5.3 years, and therefore, decay corrections within a winter season are negligible. Cobalt 60 provides radiation of steady intensity (essentially monochromatic), a condition required for satisfactory operation.

A lead cap on the tube is used to reduce radiations below danger level while the gage is transported and placed in the ground.

The lead tube directs a stream of gamma rays from the cobalt so that at 15 ft above ground the principal energy is contained within 1.5-ft circle. Within this area a Geiger-Mueller tube is suspended from a steel-pipe gallows frame. This structure is 18 ft high and 20 ft between uprights to minimize interference to natural settling of snow over the gage. Pipe for gallows was threaded in 5-ft sections so that it could be carried by pack train.

The Geiger-Mueller tube is used as radiation detector because it has short "dead time," or lapse between responses, requires low operating voltage, and is stable and rugged enough for outdoor use. Output of the tube is cabled to a telecoder, which converts

LEAD PLATES are placed over pipe containing cobalt to simulate water for calibration of system.

TELEMETERING DEVICES convert radiation pulses to electronic signal for transmission to base station.

pulse signals into a modulated signal of 8.5 and 10 kilocycles. Signals from the telecoder are fed to a data transmitter which broadcasts a signal to Pine Flat receiving station via the Spanish Mountain relay.

Before engineers left the snow gage sites, they calibrated instruments by placing lead plates of known thickness over the cobalt to simulate water content of snow packs. Readings at both snow gage locations were transmitted to the receiving station to calibrate and check the entire system. Five-minute readings were taken to establish the number of counts per minute. Without any snow, the count runs about 7,000 per min. As depth of snow was simulated, the count dropped to several hundred per minute. In all readings, about 150 counts per minute must be deducted because of cosmic ray interference.

Base receiving station just above Pine Flat Dam consists of a receiver, tele-decoder and electronic counter. Signals are picked up and translated into and registered as counts per minute. Based on calibrations made at snow gage sites, these indications will be converted directly into inches of water.

N. Y.-N. J. Palisades Parkway near halfway mark

Construction of the Palisades Interstate Parkway (in New York and New Jersey) neared the halfway point with a recent opening of the first New York section to traffic. That 13-mi portion runs from Bear Mountain to Route 45 near Spring Valley, N. Y.

Earlier this year a 4-mi section in New Jersey was completed, and most of the balance of the 42-mi-long route is under construction. As originally planned, the parkway would extend from the George Washington Bridge north to Bear Mountain, but a western extension has been proposed to carry it into the New York State Thruway.

The parkway embodies the latest designs for highway safety. In many instances the two dual driveways are at different levels to avoid headlight glare. In other places, they are completely hidden from each other by intervening woodlands or screening topography. All crossroads are bridged.

A scenic drive along the west side of the Hudson River was first proposed in 1909—but it wasn't until 1947 that construction on the present route actually started. One obstacle in the parkway's path was the high cost of privately owned property along the top of the Palisades. This land-block largely was removed in 1933 when John D. Rockefeller, Jr., donated 700 acres for the project.

Florida legislators seek "rump" session

But, while state in turmoil over mass firings, quiet returns to Miami Beach as City Manager goes back on job

Political fireworks got louder in Tallahassee last week as efforts were made to set up a special session of the Florida state legislature to put the brakes on Acting Gov. Charley E. Johns, who thus far has fired the state road board, the turnpike authority and two other commissions (ENR Dec. 17, p. 23).

Meanwhile, down at Miami Beach, the city administration has weathered a political storm of its own. Veteran City Manager Claude A. Renshaw, who resigned after a hassle with the city council over what he considered to be a dubious $15-million causeway project, has agreed to resume his post (ENR Dec. 17, p. 47).

Renshaw was given two strong inducements to continue his 28-year service:

- A petition signed by 5,100 Miami Beach citizens asking him to reconsider.
- A city council vote authorizing a salary increase from $15,762 to $20,000.

No such easy solution was in sight for the trouble in Tallahassee. The Florida constitution provides that only the governor can call a special session of the legislature. And, Governor Johns has refused to issue the call.

A group of state legislators, now active in trying to get the legislature to call itself into session, are aware that actions by a session called under these circumstances might not have legal force. Still, they think such a "rump" session has value as a forum for airing the issues raised by the governor's actions, and for influencing public opinion.

The next regular session of the Florida legislature doesn't convene until April 1955. Actually, members of the ousted boards and commissions are only "suspended" pending action by the regular session. If the governor's charges against them are not upheld by the state senate, the members may be reinstated with back pay.

Meantime, the actions of the new bodies appointed by the governor might be open to legal challenge. Of particular concern is the effect this will have on selling bonds for the proposed $62-million toll road from Hollywood, just north of Miami, to Ft. Pierce.

The governor named the following as new members of the five-man state road board: Cecil M. Webb, Tampa milling company executive, chairman; M. Johnny Walker, Gainesville auto dealer; Francis P. Whitehair, DeLand attorney, who was Undersecretary of the Navy during the latter days of the Truman Administration; Dave Turner, Ft. Lauderdale farm and garden supply dealer; and Francis M. Tarner, Pensacola bank president.

Defense procurement guide will assist construction material, equipment firms

Construction material and equipment suppliers who have been selling to the Department of Defense have long recognized that the Chicago procurement office of the Corps of Engineers is the major agency with which to deal.

But many such companies may have wondered if they weren't missing out on contracts let by other services and agencies of the Defense Department.

Last week, as a part of the department's inquiry into procurement practices, the wraps came off a consolidated list of who buys what and where. Highlight: A classified list of agencies responsible for buying 13 broad classes of construction and building materials and 25 classes of construction and related machinery.

You can get copies of the list (and a second publication outlining how to sell to the Department of Defense) from any Army, Navy or Air Force procurement office. You can also write the department at Washington 25, D. C.

The listing shows wide variations in purchasing practice. The buying of fencing, for example, is handled at 38 different locations, while roofing and siding are purchased at one. Some of the classifications are fine distinctions: Wheel-mounted power excavators for all Defense Department users are bought by the Chicago Engineers' office, while track-laying power excavators for all services are handled at the Port Hueneme, Cal., Naval Construction Center.

A simplification of bidding procedures and forms is expected to result from the current study of procurement practices.

Bids before funds

Norfolk, Va., to withhold appropriations for jobs until after bidding

The Norfolk, Va., City Council has adopted a policy of not making appropriations for capital improvements until bids are opened.

Taking immediate exception to the decision, the board of directors of the Norfolk Builders and Contractors Exchange adopted a resolution declaring that the procedure "may be contrary to the public interest."

The Builders and Contractors Exchange challenged the inference that bidding on city construction is not competitive. On this score, it was pointed out that more than 10 general contractors and 65 subcontractors bid on the last three Norfolk school jobs.

The resolution further pointed out that the procedure of obtaining budget estimates, setting up funds and then receiving bids is consistent with the practice of long standing in both government and private industry.

Councilman Robert F. Ripley, sponsor of the policy, declared that under the new system the contractor would bid on what he figures the job is worth, and the city could consider the bid in relation to estimates it had figured but not publicized.

News briefs

• **British beat U.S.**—English Electric Export & Trading Co., Ltd., underbid four competing American firms last week to win a $3.6-million McNary Dam power contract awarded by the Army Engineers. Its bid beat the nearest domestic competitor, General Electric Co., by 21%. The contract calls for installing the last two 73,684-kva generators at the Oregon project.

• **Vandals at work**—The destruction of highway signs by juvenile vandalism has become so widespread in Colorado that State Highway Engineer Mark U. Watrous complained to a U. S. Senate subcommittee investigating juvenile delinquency. At a Denver hearing the committee was told that Colorado has to replace about 2,500 signs a year (cost: $30,000 to $40,000).

• **Los Alamos laboratory**—Farnsworth & Chambers of Houston, Tex., are apparent low bidders ($4.5 million) on a 4-story building that will be the center of administrative control of the Los Alamos, N. M., atomic research program. As a replacement for a number of buildings erected during World War II, the 300,000-sq-ft structure will include scientific laboratory facilities, administrative offices, a library and an auditorium seating 600. Construction on the two-year job is expected to start early in 1954.

• **Texas toll road study**—The Texas Turnpike Authority has hired the New York engineering firm of Coverdale & Colpitts to study the economic feasibility of a proposed Dallas-Fort Worth toll road. A report on the investigation is expected by mid-May.

• **California power plans**—The Sacramento Municipal Utility District has taken steps to obtain water rights for an $80-million hydroelectric and water development project on the upper reaches of the American and Rubicon Rivers. Main feature of the proposed project is a 181,000-acre-ft capacity dam on the American River at Union Valley. Development would include four power plants: Jaybird, 77,000 kw; Camino, 52,000 kw; White Rock, 45,000 kw; Union Valley, 15,000 kw.

• **Pollution control program**—As part of a stream pollution control program, the Du Pont Co. will spend several hundred-thousand dollars for a trade-waste retention pond serving its Old Hickory rayon and cellophane plants at Nashville, Tenn. The project calls for construction, early next year, of an earth dam (450 ft long x 50 ft high) to provide an impounding basin into which all trade-waste streams from both plants will flow. Overflow from the 20-acre pond will be dispersed into the present river channel.

• **Speed limit boosted**—Starting next month, Pennsylvania will put a 60-mph speed limit into effect on an experimental basis along a 33-mi stretch of U.S. Route 22 east of Harrisburg. This is the first time a speed above 50 will be permitted on a highway other than the turnpike. The road department was authorized by the 1953 general assembly to boost speeds on certain highway sections—and whether or not the new limits become permanent probably will depend on the accident rate.

• **Coastline aid asked**—California's Governor Goodwin J. Knight has asked President Eisenhower for emergency federal aid to deal with the beach erosion situation at Seal Beach. The appeal pointed out that federally constructed jetties and off-shore breakwaters have already destroyed two residences along Southern California's coastline and now seriously threaten 30 others.

Baffles solve arena noise menace

After wrestling unsuccessfully with the problem of noisy echoes for six years, the management of Toledo's (Ohio) sports arena found a solution in acoustical baffles strung by wires from the ceiling. The baffles are made of glass fiber with a plastic coating on the outside surfaces. The plastic acts as a diaphragm for transmitting sound waves into the baffle where they are dissipated in the cellular structure of the glass fiber.

Convict labor

Virginia is asked to cut its prisoner highway force

The matter of prisoner road forces competing with private enterprise has been brought into the open in Virginia by a recommendation of the Virginia Advisory Legislative Council that the state curtail convict activities in highway construction.

The council—reporting to the general assembly after a year's study—covered all areas of state rivalry with private labor and industry. But six of its seven recommendations dealt with employment of convict road forces by the highway department.

What the council seeks to do is to cut the size of the convict road force to a minimum. Then—to take up the slack left by de-emphasized highway work—it wants legislation to permit use of convicts for such projects as reforestation, soil erosion control, water conservation, construction of public recreation areas and prison farming.

Construction by convict labor, according to the council, costs more than work done by private industry and labor.

Yet as it stands now, the report says, around 1,800 prisoners in convict road forces account for 14.6% of Virginia's highway construction and 5.5% of its maintenance work. This is compared with 20% construction and 80.1% maintenance work done by highway department personnel—and 65.4% construction, 14.4% maintenance work carried out by private contractors.

• **Highway Dept. hit**—The council also called attention to work done by personnel of the state highway department itself. "The department's free labor force should not be used for any construction or maintenance work that can be contracted."

The percentage of highway funds expended through contract operations (according to the report) has remained relatively constant since 1935—and the percentage used for operation of the convict road force has declined, but the road department has shown a marked increase in the use of its own labor force.

The Virginia Road Builders Assn. (sponsoring the legislation to find new occupations for prisoners) provided much of the information for the council's report. Archer Gay, engineering director of the association, points out that 11.9% of the total highway department expenditure is for the convict road force. "Yet it costs $1,007 to keep each convict on highway, $481 to keep them in prison."

The road department has to pay the Department of Welfare and Institutions not less than 90% of the wage currently paid free labor. Under this law convict labor wages have been set within a range of 67-80 cents an hour. Unskilled labor (amounting to the major portion) accounts for the 67-cent rate.

• **More findings**—Often taking an opposite viewpoint on the convict's role in construction are recent findings of the Bureau of Population and Economic Research at the University of Virginia. The Bureau made a study of prison labor and industry for the Department of Welfare and Institutions. It comes to the conclusion that prison production offers no serious competition to private enterprise. Among its recommendations: The highway department should continue to be granted wide latitude in its use of convict labor.

According to the bureau, if prison activity were cut to 1.2% of the present level, it would mean that the value of construction and maintenance done by prison labor would be roughly $3.6 million. The number of highway work bidders is currently 550-600. If contracts were divided evenly among 450 bidders—each would receive about $8,000 in additional income (or, with a 20% profit margin, $1,600 additional income). At the same time, says the bureau, roughly 1,000 inmates would be forced into idleness or have to be assigned to less competitive lines of work.

A spokesman for the Department of Welfare and Institutions, William Maner, says its main concern is to keep prisoners busy. "We want them to work—but we are not opposed to finding other means of doing this. If the council can find the way, we'll go along."

Meanwhile, other states are facing the same problem of convict labor competition. North Carolina, for example, uses about three times as many prisoners on its highway work as does Virginia—and spends three times as much money for the labor.

But the general opinion of all concerned is that any changes in the present system will have to be gradual.

Wage line held

Chicago lathers sign 3-year no-pay-increase contract

A wage-stabilizing move for lathers in the Chicago area was completed last week (Dec. 14) when Local 74, AFL, of the Lathers International Union signed an agreement not to ask for a pay raise for three years.

Members of the 1,000-member union now get $3.30 an hour. In addition, for the last several years, employers have paid 22½ cents an hour into a fund for pensions, health and welfare benefits and for promotion of the lathing and plastering industry.

The agreement, which will remain in effect until June 1, 1956, was signed with the Employing Plasterers Assn. of Chicago, composed of 38 contractors. Union president, George T. Moore, declared that the long-term, no-raise agreement was signed to help assure continued high employment.

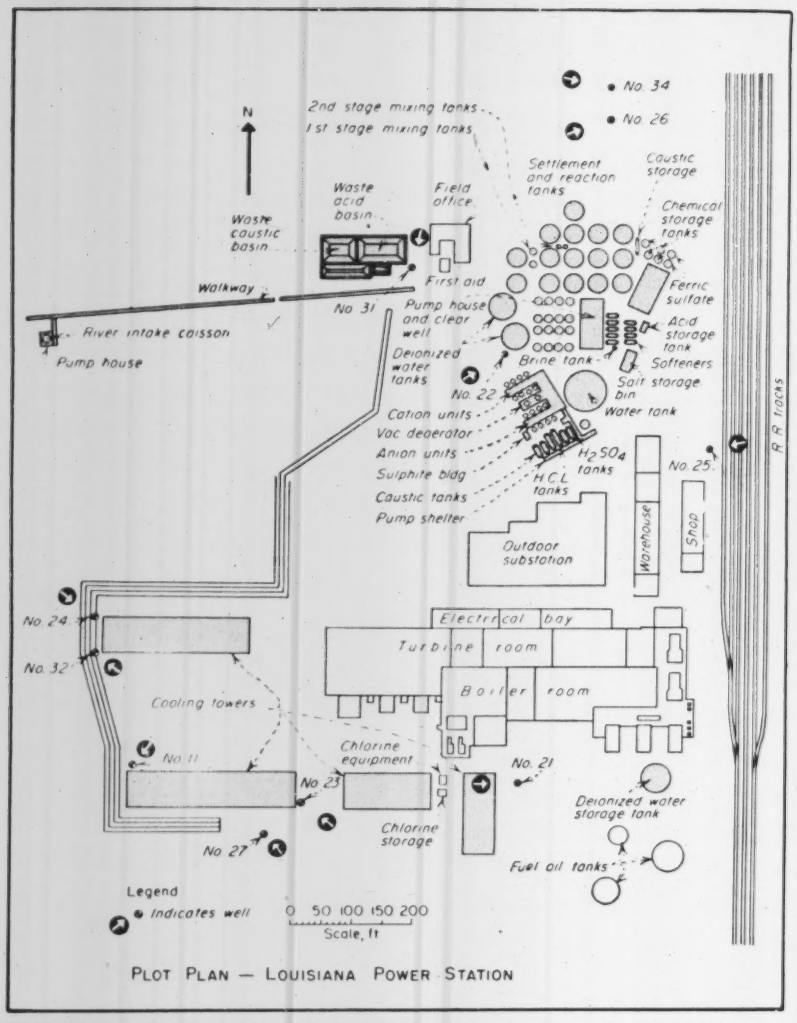
While the lathers were agreeing to work for the next 2½ years without wage increases, the plumbers in Chicago were negotiating for more money. Local 130, AFL, of the Chicago Journeymen Plumbers, is asking for a 11% "package" raise. Of this amount 4% would be wage increases and the remainder holiday and vacation pay for the 5,500 member plumbers. They are negotiating for the increase to become effective next June 1 but so far have found stiff resistance by the contractors.

Time out called in pay talks

With the contractors suggesting wage cuts and the unions asking pay increases of $1 an hour, negotiations at Seattle have recessed until after the Christmas holidays on a new contract between the Alaska Chapter, Associated General Contractors and eight American Federation of Labor unions.

The employer group has requested a 25-cent hourly wage cut from the present scales, ranging from $3.09 an hour for laborers to $4.19 for bricklayers, declaring that economic conditions throughout Alaska have become stabilized and the cost of living has been lowered. It also suggests elimination of some of the fringe benefits.

The unions, however, want subsistence, travel time and double time for overtime, in addition to a $1 hourly wage increase.



PLOT PLAN — LOUISIANA POWER STATION

WELLS SPOTTED ON POWER STATION SITE augment an already sizable water supply. Altogether, industrial water for this steam station will add up to 13,000 gpm. Shaded areas in this plan view of the plant are water supply, treatment facilities.

Deep wells plus river water fill big power plant needs

Alton Kirkpatrick
Assistant Chief Mechanical Engineer
Stone & Webster Engineering Corporation

Water—lifeblood of any steam-power plant—is an extra special problem for Louisiana Power Station on the east bank of the Mississippi at North Baton Rouge. The station sells so much steam to neighboring industries—without return of condensate—that boiler make-up demand is extra high.

With new boiler capacity put in operation during November, this plant became probably the largest by-product power station in the public utility industry. A combination of straight condensing and non-condensing by-product plant, Louisiana Station has just added boiler capacity of 1,800,000 lb per hr at 1,450 psi (and 950 F) to former steam capacity of 3,555,000 lb per hr at 600 psi.

This puts the plant high in the ranks of large industrial users of water. And it makes water supply and treatment a major problem. Water must be delivered of the right quality and of sufficient quantity for boiler feed make-up, to replace steam sold to neighboring industries plus boiler blowdown; for cooling tower make-up, to replace evaporation and cooling tower blowdown in the straight condensing section of the plant.

For 1954, these required water quantities (in gpm) are estimated:

Boiler feed make-up		
Zeolite treatment	5,500	
Deionizing treatment	4,000	9,500
Cooling tower make-up		3,200
Other uses		300
		13,000

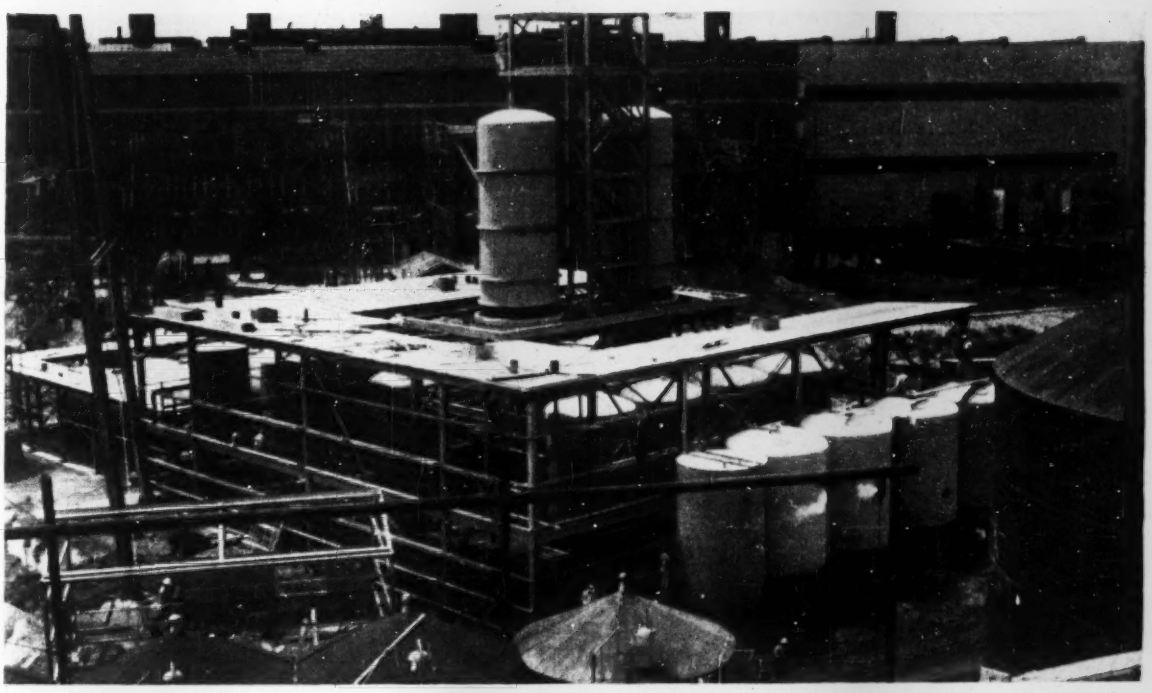
Here is how all this water is supplied and how it is treated for use.

• **River pump station**—The water for make-up and general plant purposes is obtained from two sources, the Mississippi River and deep wells penetrating subterranean water strata. River water is used in the zeolite water treating plant because of its lower silica content. The well water contains 25 ppm of silica which cannot be reduced economically to permissible values by the clarifiers and zeolite treating plant.

The river water pumping station is of the caisson and siphon type, located on the levee about 150 ft in from the normal water edge. It consists of four 3,000-gpm vertical motor-driven pumps designed for 150-ft head and driven by 150-hp motors at 1,150 rpm. These pumps are installed in an 18-ft dia caisson, constructed of steel sheetpiling with concrete base at El. −9.0 and operating floor level at El. +52.0 which is 4 ft above maximum high water. The caisson is constructed on 16 piles which penetrate a stratum of blue gumbo at El. −48.

A pumping station in this location presents a number of extremely difficult problems—brought about by most unfavorable subsoil conditions and very severe floods, in which the river flow is many times the normal and the river stage rises from a normal low of El. +2 to El. +48. (Two similar stations of larger size are located about ½ mile downstream on the property of Esso Standard Oil Company. These stations were designed and constructed by Stone & Webster Engineering Corporation in 1943 and 1946.) This type of pumping intake has the advantage that it can be located a sufficient distance inshore so that it need not withstand the high velocity of flood waters nor the collapse of the soft alluvial clay river bank.

Three 16-in. siphon lines, 250 ft long, have inlets in the river at El. −1.0 and lead into the steel caisson at El. 20.0, then turn downward and terminate just above the top of the caisson floor at El. 9.0. Two motor



INDUSTRIAL WATERWORKS are a considerable part of the entire plant. This is part of the deionizing water treatment plant.

driven vacuum pumps create sufficient vacuum in the siphon pipes to maintain water level within the caisson, which at a total flow of 6,000 gpm is about 3 ft below river water level. The pump discharge lines are connected back into the siphon lines, and by operating valves in the caisson it is possible to flush the siphon lines into the river with water from the pump discharge.

In 1948 a new supporting structure for the river ends of the siphon lines in the form of a giant pile was installed with bottom at El. −100.0, top at El. +10.0. It consists of five 36-in. H-beams and interlocking sheet-piling, welded together and filled with concrete. A crossarm supports the three 16-in. siphon lines.

The river pumping station supplies the zeolite water treating plant, which provides boiler feed make-up for the 600-psi boiler plant, the latter being the principal source of 135-psi steam sold to neighboring industries. This steam, as stated above, must be replaced with make-up water from an outside source.

• **Zeolite water treating plant**—This plant, part of which was installed with the original power station in 1929, now has a capacity of approximately 4,500 gpm. It consists of two-stage chemical treatment for clarification and reduction of silica with partial softening followed by filtration through gravity anthracite filters. The water is then pumped through carbonaceous zeolite units for completion of softening before delivery into an elevated storage tank 231 ft high, whence it flows through a series of heat exchangers to the open feed water heaters in the boiler house as boiler feed make-up.

Cooling tower make-up is required to replace (1) evaporation to the atmosphere which is the principal source of cooling in the cooling tower and (2) blowdown which is required to maintain alkalinity of the cooling water below the point where it will cause deterioration of the redwood of which the cooling towers are constructed.

In the case of Louisiana Station this make-up amounts to about 3,200 gpm and consists of water obtained from deep wells.

• **Deep well supplies**—In the Baton Rouge area, municipal and domestic water supplies as well as large amounts of water for industrial use are obtained from deep wells. Since the shallower water bearing sand strata were already drawn upon heavily by these demands, it was decided to tap deeper sources of supply for the new addition to the existing well field. Wells already drilled to the 2,000-ft level yield a large quantity of good water but, rather than overdraw this stratum, it was decided to investigate the deeper sands.

Records of the U. S. Geological Survey indicated the possibility of a good water-bearing stratum somewhere between 2,300 and 2,400 ft. However, the driller's log obtained from a test well at the site indicated that this stratum was pinched out to a very thin layer of fine sand in this locality precluding its use as a possible source for a large quantity of water. Further exploration using the same test well indicated that between the depths of 2,700 and 2,800 ft there was an aquifer that probably would support wells that would flow free at the surface.

It is planned to drill three wells (Nos. 31, 32 and 34) into this stratum for use as cooling tower make-up along with well No. 11, while five wells (Nos. 21, 23, 25, 26 and 27) will be drilled to about 2,000 ft and will be supplemented by existing well No. 22 to supply water to the new deionizing plant. No. 21 is well No. 1 redrilled.

Each of these two individual groups of wells has a separate collecting system with an interconnection for emergency use only.

With a well capacity conservatively estimated at 850 gpm for each well, the completed system will allow for a spare well in each group.

The first step in the construction of the new wells generally consisted of setting and grouting a surface casing 18 or 20 in. in diameter, followed by setting and grouting the 12-in. casing to a depth of about 1,900 ft. Screens 8 in. or 9⅝ in. in diameter were either set directly below the 12-in. casings or on the lower end of

TABLE I

Well No.	11	21*	22**	23	24	25†	26	27	31	32	34†
Depth in Ft	1,182	2,000	2,064	2,091	2,080		2,085	2,188	2,808	2,776	
Expressed as Calcium Carbonate, ($CaCO_3$), ppm											
Total Hardness	8	5		2	3		5	4	4	6	
Alkalinity											
Bicarbonate	118	114		122	126		116	114	252	390	
Total	118	150		146	162		162	154	340	428	
Expressed as ppm											
NaCl	8	1		4	4		5	8	32	77	
SO_4	8	10		10	11		10.5	9	8	5.5	
SiO	51	25		25	23.5		24	22.5	26	26.2	
PO_4	7	5		5	5		5	3.5	5	—	
pH	8.0	8.8		8.8			9.12	9.9	9.1	8.9	
Temperature, F	78	88		89	89		88	91	98	98	

*Existing well to be redrilled
†Wells incomplete
**Analysis not available

TABLE II

	(A)	(B)	(C)
pH	9	10.5	10.5
Constituents	ppm		
Calcium (Ca)	0.8	21	30
Magnesium (Mg)	0.3	5	6
Sodium and Potassium (as Na)	78.0	35	75
Chloride (Cl)	1.5	43	112
Sulfate (SO_4)	2	33	47
Nitrate (NO_3)	—	2	3
Bicarbonate (HCO_3)	161	0	0
Carbonate (CO_3)	22	24	24
Hydroxide (OH)	—	3.5	3.5
Silica (SiO_2)	25	5	5-6
Total dissolved solids (Calc.)	291	172	305

(A) Average well water (design conditions)
(B) Average clarified Mississippi River Water
(C) Maximum clarified Mississippi River Water

TABLE III

Water Supply	(A)	(B)	(C)
Total impurities, less than	2.0	2.0	2.0
Silica (SiO_2)	0.1	0.1	0.1
Iron and aluminum oxides (R_2O_3)	0.05	0.05	0.05
Free carbon dioxide (CO_2)	0.1	0.1	0.1
Free oxygen (O_2) with each deaerator carrying 50% of total load	0.1	0.1	0.1
Free oxygen (O_2) wih one deaerator carrying total load	0.15	0.15	0.15

solid pipe extending below the bottom of the 12 in. casing into one or more water bearing strata. A stainless steel, wire-wound type screen was designed for each well with the length of screen and spacing of wire governed by conditions encountered at the individual well. Driller's logs and material samples were correlated with Schlumberger electric logs taken at each hole. Since most earth formations conduct electric currents only because of their contained water, these electric surveys measuring the resistivity of formations that have been penetrated are used to check potential water bearing strata.

Water analyses for the existing wells and for those that have been completed to date in the new program are shown in accompanying Table I above.

• **Deionizing plant**—When Louisiana Power Station was built in 1929, steam conditions of 600 psi and 750 F were the maximum possible with the high percentage of make-up for boiler feed purposes occasioned by the delivery of steam to neighboring industries with no condensate return. With the advent of the deionizing type of water treating plant which reduces total dissolved solids including silica to extremely small residuals, noncondensing steam turbine generating plants were permitted to operate at 1,450 psi and 950 F without fear of excessive maintenance expense despite the high percentage of boiler feed make-up inherent in this type power station.

The new deionizing water treatment plant has a nominal capacity of 3,500 gpm. Well water at 50 psi is first supplied to the cation units, consisting of eight shells, 11 ft in diameter, each having an exchange capacity of 17,000 kilograms. From the cation units it then flows under automatic level control to two rubber lined cold water deaerators, operated at low vapor pressure with vacuum maintained by three-stage steam ejector units, where O_2 and CO_2 are removed and discharged to the atmosphere. There are two deaerators, both 10 ft diameter. From the deaerators the water flows to eight 11 ft dia. anion units each having an exchange capacity of 3,800 kilograms. From the anion units the finished water, of high purity flows to three 500,000-gal storage tanks where it is available for boiler feed make-up.

Analyses of the well water and clarified river waters are expected to be within the limits indicated in columns (A), (B) and (C) shown in Table II.

The water treating plant has sufficient capacity for back washing and rinsing the units without exceeding a normal flow rate of 5 gpm per sq ft with all units in service.

The cation units receive influent water from a loop header system and discharge to the vacuum deaerators, whence pumps deliver deaerated cation treated water through a header system to the anion exchange units, then discharge from there to three 500,000-gal deionized water storage tanks.

Cooling water from the first and second stage barometric condensers of the deaerator evacuating equipment discharges to a catchment tank from which it is pumped into the influent header system to the cation exchange units. Cooling water from the third stage condenser discharges to waste. Separate loop header systems are provided for backwash and rinse effluents from the cation exchange units with each loop header discharging to two sumps, one for use during automatic operation and the other for manual operation. Similar provision is made for effluents from the anion exchange units.

• **Deionizing plant regeneration**—Regeneration of cation and anion exchange units including waste delivery to basins and reclaiming of regenerant and rinse is entirely automatic, except for start and stop by push button. Each unit regeneration is entirely independent of the other units. Two separate automatic regenerant systems for the cation units are included. The first system provides for introduction of reclaimed sulfuric acid followed by new concentrated sulfuric acid diluted to two successive concentrations, or the introduction of reclaimed hydrochloric acid followed by diluted new sulfuric acid and new hydrochloric acid as a second system.

Two separate regenerant systems for the anion exchange units are provided. The first system is automatic and includes the introduction of dilute caustic soda reclaimed in a storage tank from a previous regeneration followed by diluted 25 percent caustic soda. The caustic regenerant delivery pumps take suction from the regenerant storage tanks and distribute to a mixing chamber for dilution with warm water. Surface type heat exchange equipment and a warm water storage tank, including necessary pump controls and accessories, are included to provide warm water for caustic dilution and for circulation through heating coils in the new and reclaimed caustic storage tanks. The second system serves as a spare, is controlled manually and consists of new 25 percent caustic, is diluted with cold water and delivered

WAHLEACH, BRITISH COLUMBIA

Another Penstock job made easier with

DRESSER COUPLINGS

Lighter, high-yield steel pipe cuts tonnage, shipping, installation costs . . . speeds completion of 1760-foot Wahleach penstock.

Six weeks after construction began, this 70″ penstock—the fourth Dresser-Coupled installation made by the B. C. Electric Company—was ready to deliver water to a 75,000-kva power plant near Vancouver, British Columbia.

Eliminating extensive excavation, resilient gaskets in Dresser Couplings allowed the penstock to be deflected to the natural contour of the right of way. The lighter weight and longer lengths of high-yield steel pipe meant easier handling, fewer joints and anchors. A field crew of 20 men—with a minimum of skill, supervision and heavy equipment—*Dresser-Coupled 1,000 tons of steel penstock in 21 working days.* Under test, the line proved absolutely bottle-tight.

Dresser Couplings permitted faster completion of the line and assured permanently tight, maintenance-free joints. This resulted in *earlier revenue* from plant operation . . . *uninterrupted service* to power consumers.

Above—Overbends made by 1° deflections at each field joint eliminated shop-made bends and special anchors.

Left—Four men averaged less than four hours making bottle-tight joint . . . 975 psi working pressure, 1500 psi shop test on couplings.

Project designed by B.C. International Engineering Co., Ltd.
Penstock installation by Arrow Transfer Co., Vancouver

BE SURE you get a *better, faster* penstock installation. Put high-yield steel pipe and Dresser Couplings in *your* specifications.

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directly to the regenerant header line.

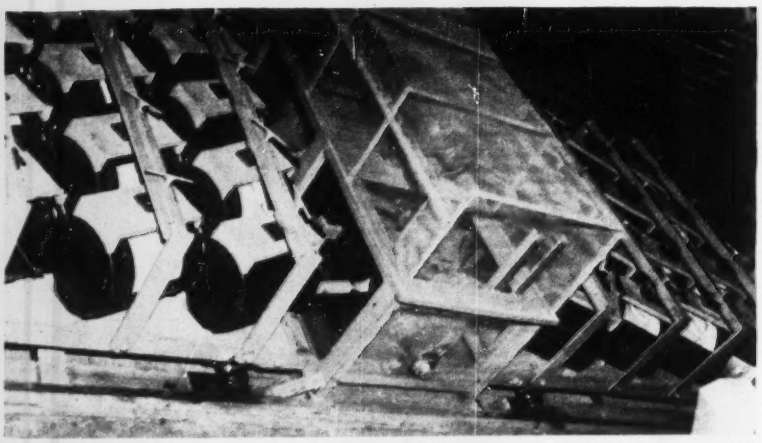
The impurities remaining in the deaerated and deionized water are guaranteed not to exceed amounts of Table III in parts per million, when using water of analyses (A), (B) and (C) shown in Table II.

• **Deionizing plant waste disposal**—The waste disposal plant consists of two large earth basins, one for acid and one for caustic wastes, in addition to a small sludge detention tank and mixing flume. The sequence of operation involves the use of a sufficient quantity of alkaline sludge from the presedimentation tanks of the existing zeolite water treating plant to neutralize partly the acid flowing from the waste acid basin into the mixing flume, using air for mixing. Further along in the flume, waste caustic is added to the sludge acid mixture to raise the pH to above the neutral point prior to discharge to the swamp. It is expected that the present clarifying plant can produce sufficient alkaline sludge to neutralize all excess acid from the deionizing plant, but for use under extraordinary conditions provision is included for feeding lime.

Motor operated valves with push button controls located on the anion control master panel in the deionizing plant are provided to control the rates of flow of sludge, acid and caustic into the mixing flume. Instruments in the deionizing plant proper are provided to record the levels in the waste basins and the pH of the treated mixture going to the swamp.

The auxiliary equipment for the waste disposal basins includes centrifugal blowers providing air for mixing by aeration of sludge, acid and caustic in the mixing flume, sampling pumps for pH measurement before and after neutralization and remote controllers for measuring level in the basins. It is expected that aeration of the sludge acid mix will remove considerable carbon dioxide which otherwise would require neutralization with caustic. In the event of a sludge or caustic waste deficiency, it is expected that aeration will substantially reduce the amount of lime feed that would be required.

Design and construction of the new water supply and treatment facilities for Louisiana Power Station are under the direction of Stone & Webster Engineering Corporation. R. J. Robertson, superintendent of production, Gulf State Utilities Company, and W. B. Gurney, efficiency engineer, Louisiana Power Station, collaborated in the design of the facilities for supply and treatment of make-up water for boiler feed and cooling tower water.



TWO PLATFORMS, roller-mounted in a horizontal position, hold paint cans while 5-hp motor operating through eccentrics shakes them.

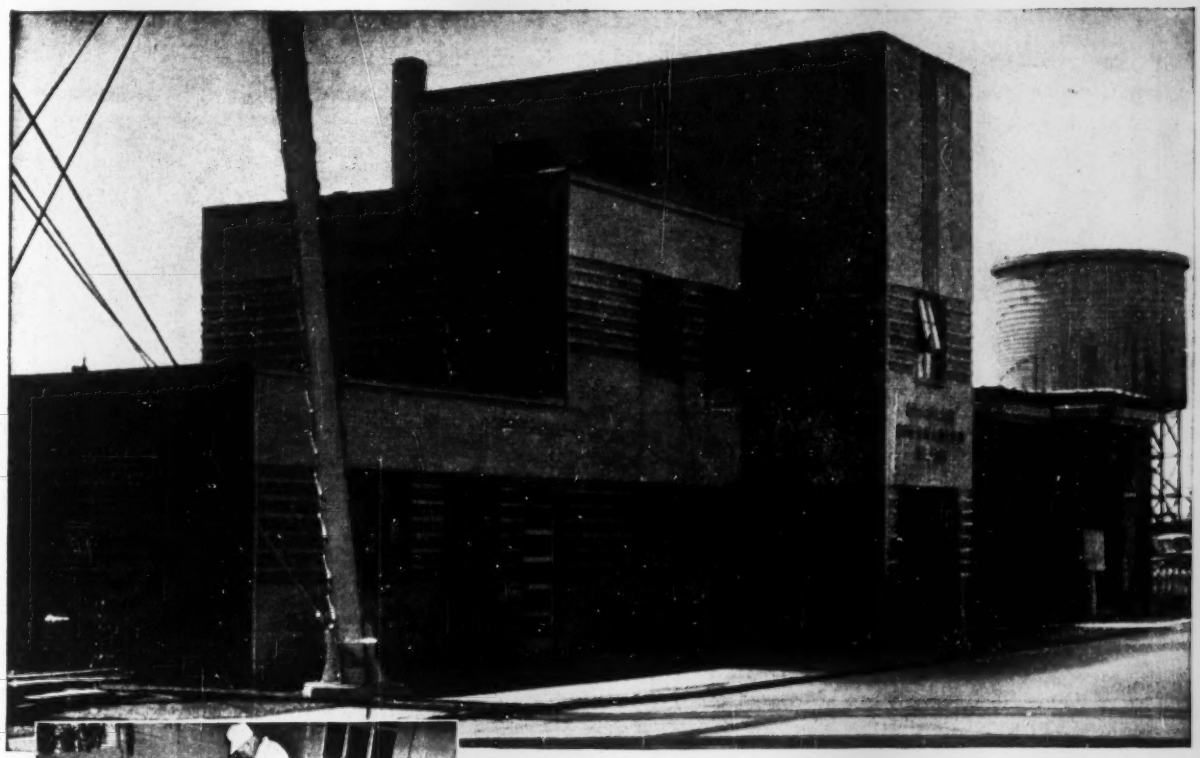
Shop-made shaker mixes paint

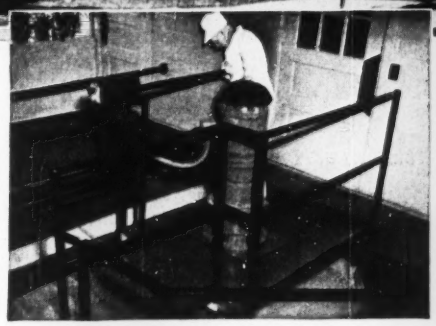
For convenience in field handling, the Connecticut Highway Department buys its road centerline marking paint in 5-gal. cans. Mixing the paint, however, was a headache until this 32-can shaking machine was devised. Previously crews had to work far into the night to prepare enough paint for the next day's center-striping work.

The new shaker, built by the department's shop crew at Portland, Conn., transforms 2,080 lb of paint from a semi-fluid state to a fluid state in 90 minutes. After shaking, the paint remains usable for 7 to 10 days.

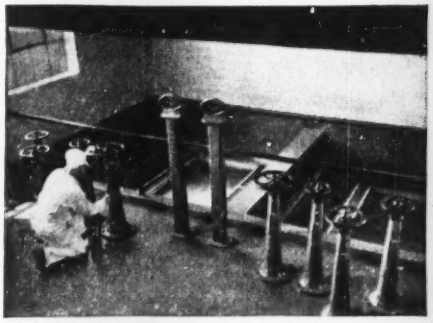
A 5-hp electric-motor power unit is flanked by two wooden platforms, each carrying 16 cans. The platforms have ball-bearing rollers that run in channel-iron tracks. Oscillatory motion is imparted to the platforms by eccentrics that are connected through a reduction gear box to the motor. The paint cans are clamped to the platforms in a diagonal position, which is believed to yield the best mixing results with the machine's reciprocating motion.

PREFORMED SUBMARINE CROSSINGS were used in the expansion of Ft. Lauderdale, Fla., water service. The cast-iron pipe lengths were completely assembled on shore and then bent at the ball and socket joints to fit the configuration of the river bottom. Wire cables of the proper length to maintain the shape were used to attach the completed section to an I-beam. The entire assembly—150 ft long—was picked up by cranes and lowered into position when the cables were released. The 12-ft lengths of 24-in. dia pipe were secured at the joints with lead jointing material. At the end of the crossing two lugged 22½-deg. bends were used with two lengths of lugged pipe, one lugged ell and one lugged pipe on each river bank—Dewey W. Jonhson, Cast Iron Pipe Research Assn., 122 S. Mich. Ave., Chicago 3.





Staples' compact Permutit Precipitator has 400 gpm capacity. Softens hard well water, removes turbidity, iron, and manganese.



Two 8' x 9' Permutit Gravity Filters remove last traces of suspended matter, deliver a crystal-clear, softened water.

How *Staples, Minnesota gets soft, clear water*

Staples' well-water supply caused plenty of trouble . . . total hardness 275 ppm, alkalinity 200 ppm, iron 3 ppm, turbidity 30 ppm. To solve these problems, Staples turned to Water Conditioning Headquarters.

Now Mr. E. H. Klang, Supt. of the Water and Light Dept., reports the Permutit-treated water "very fine in all respects—very clear."

Permutit recommended the equipment shown at left, plus a carbonation tank. Turbidity is reduced to only 3 ppm . . . iron to 0.1 ppm. Hardness and alkalinity are reduced to specified requirements. Because of high Precipitator efficiency, each filter is backwashed only once a week for 20 minutes.

"The Precipitator has not given any trouble. The Permutit filter is one of the best . . . has been trouble-free," adds Mr. Klang about the Permutit equipment installed in 1939.

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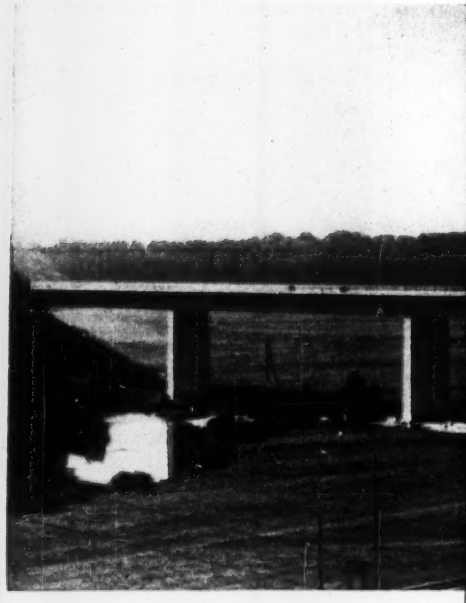
"MOST COMPLICATED"

Van Wyck Expressway (above), cutting across Queens Borough to New York's Idlewild Airport, last month was tied into this interchange. Grand Central Parkway, serving the northern side of Long Island, is at left. Interborough Parkway, heading southwestward, is at lower right. The new connection will permit fast travel between La Guardia and Idlewild airports.

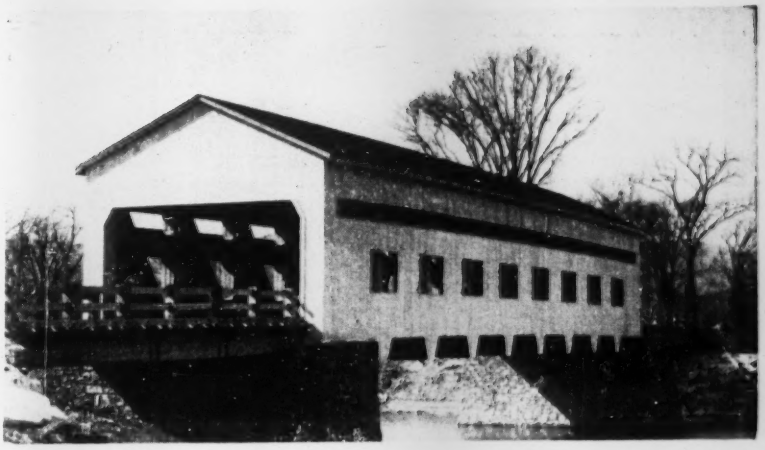
BACK IN OPERATION

Chicago's Michigan Avenue, closed for a year near Grant Park, was reopened to traffic recently but with a few additions. In place were these new ramps leading down to an underground parking garage that eventually will provide space for 2,360 cars.



COVERED BRIDGE COMEBACK

This covered wooden bridge—believed to be the first one built in New England in the present century—was opened for traffic at Sheffield, Mass., a few weeks ago. It was in response to rising interest in preserving this type of design (rapidly being destroyed by traffic and floods) that the state consented to build the new bridge in the old manner. The $330,000 three-span structure has a 25-ft roadway, and is designed for 15-ton truck loading.

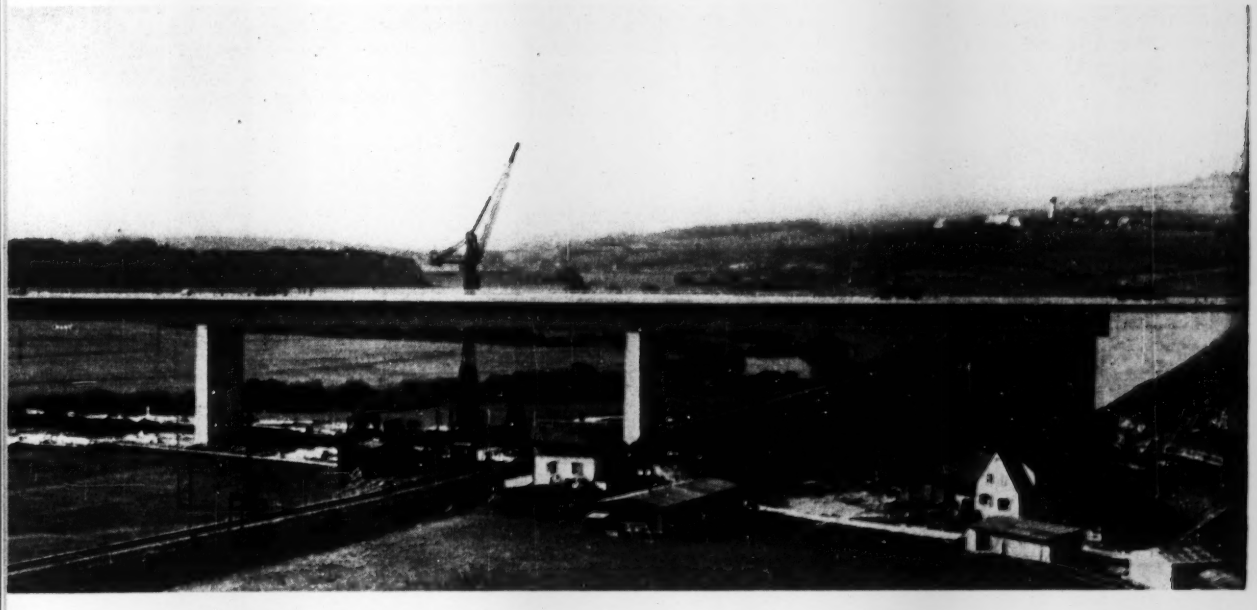


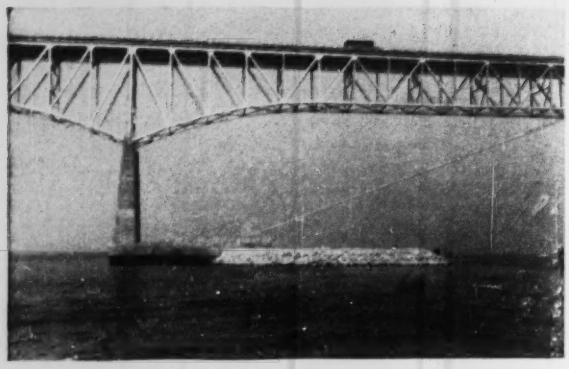
RISING FROM RUINS

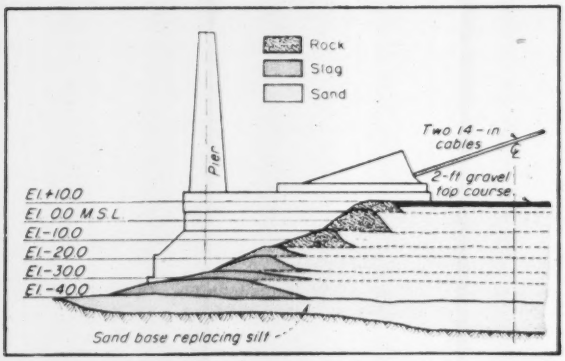
In Seoul, Korea—rising amid old tiled and thatched roof cottages—60 or so new mud tile dwellings mark the progress being made on a 500-house project now under way. Construction is simplified: workers make mud tiles right on the spot, lay them in rows, then cover them with cement to form the walls.

OVER THE DANUBE

The completed Danube Valley Bridge (below) near Ulm, Germany, is a continuous five-span prestressed concrete structure 1,230 ft long (ENR Sept. 3, 1953, p. 43). Three mid-spans are each 230 ft long. Built in two sections, the first section of the bridge was finished in October, 1952, and then work stopped during the winter. Completion of the structure was carried out in 1953.







ACHILLES TENDONS of Chesapeake Bay Bridge are cables that extend diagonally from suspension bridge side-tower saddles to anchor block at next pier. Islands built in 40 ft and 55 ft of water keep ships from fouling the cables.

Man-made islands protect bridge cables

Seven hundred thousand cubic yards of sand, slag and stone went into a pair of million-dollar islands recently completed to protect suspension-span cables on Chesapeake Bay Bridge (ENR Aug. 7 1952, p 40).

The big construction problem was the accurate underwater placement of dikes, rectangular in plan, that confined successive lifts of sandfill for each island. The solution, a plotting device that gave barge position and crane-boom angles for every bucketful of material, will be described. But first, it is necessary to tell the reason for the islands and to give some information on their design and construction:

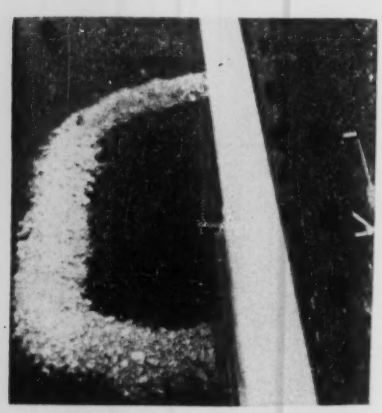
A glance at the photo above shows why the cables need protection. Each pair extends diagonally across the opening beneath an approach span adjoining the suspension bridge. At their lower ends, the cables tie into a low-level anchor block that also supports approach spans. If a ship strayed from the navigation channel two spans away it could strike the anchor block or one of the cables—in the latter case possibly crippling the bridge and quite possibly the ship. Side-slopes of an island would protect both.

• **Lots of water**—In this part of Chesapeake Bay's expanse (the whole bridge is 4.2 mi long), there is plenty of depth to allow a ship to stray from course. At one island site the water is about 40 ft deep and at the other 55 ft. But this depth accounts for only about half of the project's total yardage. To provide a suitable foundation for each island it was necessary to extend a sand base that had been placed for anchor-pier construction. A silt bed, overlying sand at El. −70 to El. −125, had been removed and replaced with clean sand. On the island job, extension of each old base to outside dimensions of 600x800 ft required the filling of a U-shaped trench that took 68,000 cu yd at one pier, and 284,000 cu yd at the other.

Another 224,000 cu yd of sand went into the interior sandfill of the islands. Seven lifts penned in by the riprap dikes varied in height from 5 ft to 10 ft. The dikes were laid with outer slopes of about 1 on 2 and with inner slopes about 1 on 1½. Upon the completion of each dike the sandfill was brought up roughly to the level of the dike's top.

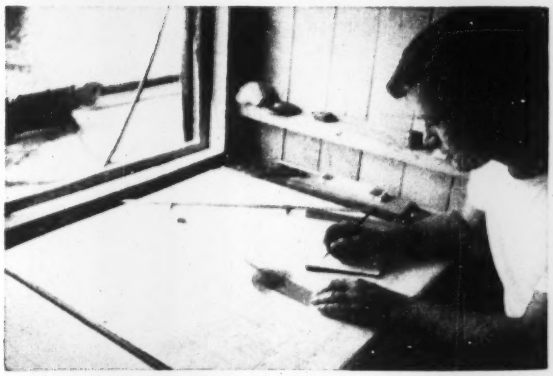
Top widths of dikes were about 10 ft. Dimensions of the broken rectangle at the top of the riprap slopes are 138 x 150 ft. (One side is interrupted by the anchor pier.) The top three dikes (lifts 5, 6 and 7), from El +10 down to El −15, are made up of quarry-run rock ranging from 5-lb spalls to 4,000-lb stones. Below El −15 it originally was planned to bottom-dump stone from barges, but the material spread so badly that coarse slag and a different placement method were adopted after the first three dikes were laid. Material ran 70% over the estimated in these three lifts. (Bottom-dumped sand had been used for filling the base trench, and it also was used for sandfill inside the dikes up to the practicable limits—about El −15.)

• **Placement**—Slag dikes were placed



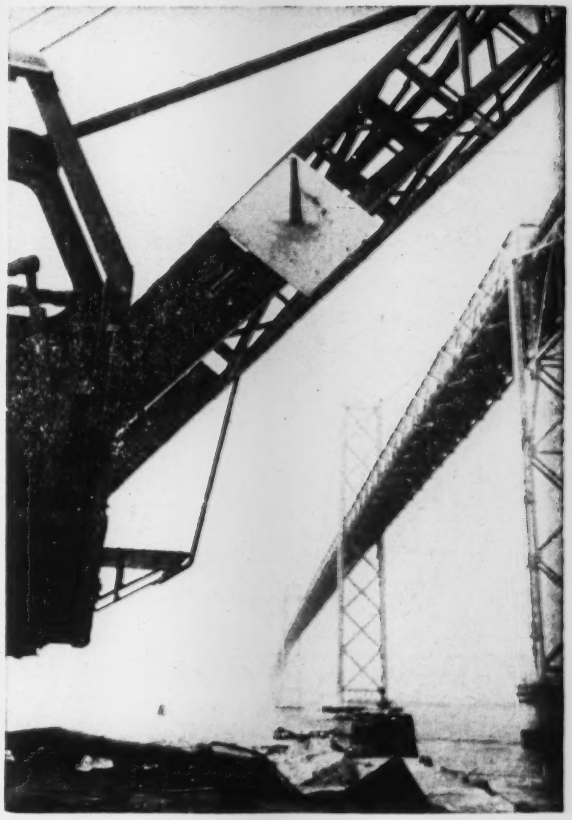
LOOKING DOWN—Part of top-lift "berm" before sandfill was placed.

FINAL SANDFILL was piled behind berms by barge-mounted clamshell, and spread by a front-loader. Lower lifts had been bottom-dumped from barges.



ROOM PLOTTER—Celluloid device positioned on site plan gives correct boom angles for underwater material placement.

PLACING ROCK BERM in proper position above water was easy, but 90% of islands' material was placed under water.



BOOM INDICATOR—Protractor board with two pointers enabled quick positioning of boom for any specified reach.

by a 2½-yd clamshell bucket hoisted by a crawler crane on the deck of a 40x100-ft steel barge. Taking the slag from a deck scow alongside, the crane laid its bucketloads on the center-line of the dike up to a predetermined grade and then the pile was checked to ascertain that the dike top was 10 ft wide, or widen it if necessary. Piles were built in this manner at 10 ft intervals along the dike centerline and a check for grade and width was made at the midpoint between these piles as the work progressed. Any low spots located by subsequent surveys of the dike were corrected before the sandfill was placed within the dike.

Rock dikes were placed by the same rig, using a 3-yd clamshell with teeth. Interior fill above the limits of barge dumping was piled by clamshell and bulldozed into place by a front-loader, which also placed a 2-ft gravel blanket to top out the island.

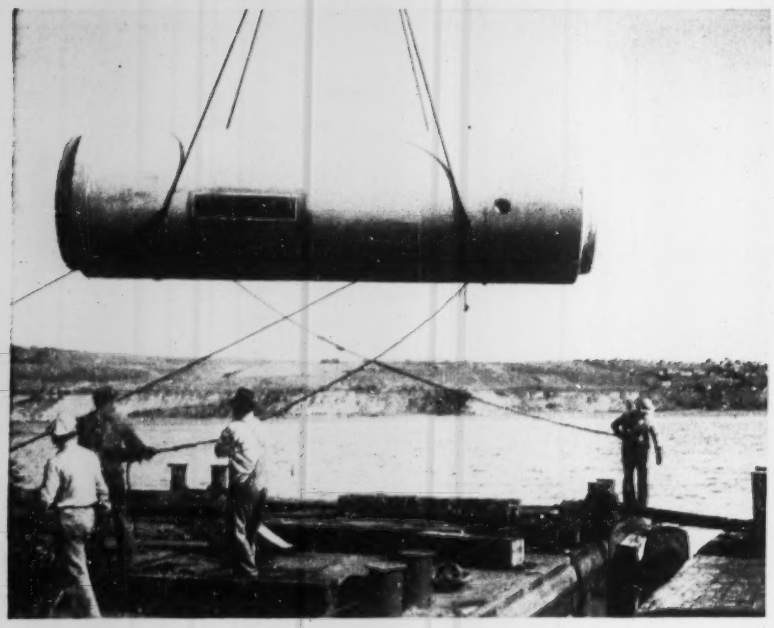
• **Troubles below**—The ease of this above-water work was in sharp contrast with the difficulty of underwater material-placement, which accounted for about 90% of the yardage. One device, an electronic depth meter, saved field engineers many hours of work with the lead-line. When they checked the position of dikes and fill they merely ran a series of cross-sections each way across the submerged mound.

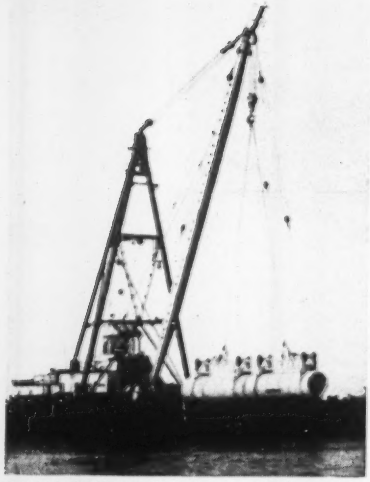
But there were no ready-made devices for telling the crane operator where to place his bucket. To overcome this lack, field engineers of Construction Aggregates Corp., Chicago, in conjunction with the inspectors of J. E. Greiner Co., Baltimore, devised a method of location employing a plotting board in a shack on the barge deck. The sheet was a plan showing the bridge's anchor pier and the plan location of the dike in progress. A celluloid sheet made up to represent the barge, at the same scale as that of the plan, had a one-arm protractor pinned to it at the scale position of the crane's pivot. When the barge was anchored in approximate position for placement of a series of bucketloads, two distances and one angle were measured between two points on the barge and two fix points on the anchor pier. Using this information the plotter was positioned on the plan and the protractor arm was swung to the point where the first bucketload was to go. The protractor arc gave the swing angle for the crane; distance from the pivot was given by the scale on the protractor arm.

A protractor board on the crane boom, visible to the operator, and calibrated to read directly the distance from the pivot of the crane to the bucket line, readily showed him when the angle of the boom was correct. The board carried two pointers on a common pivot. The pointer nearest the board was clamped at the correct distance mark while the second remained free-swinging. By raising or lowering his boom the operator brought the free-swinging pointer into coincidence with the fixed one, while he also swung his crane to the correct horizontal angle. This angle was found by reference to painted degree markings on the barge deck at a radius of 15 ft from the crane pivot.

Correct dumping depth was indicated by a marking on the bucket-holding cable.

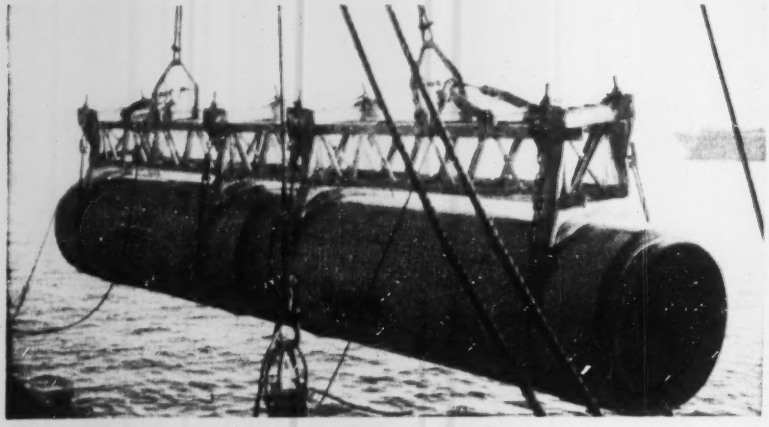
Design of the islands and construction supervision was performed for the Marvland State Roads Commission by J. E. Greiner Co., Baltimore. (Also designers of the bridge). J. G. Lutz was resident engineer. For Construction Aggregates Corp. Gino Matuzzo was superintendent and August Stoeffler was project engineer.



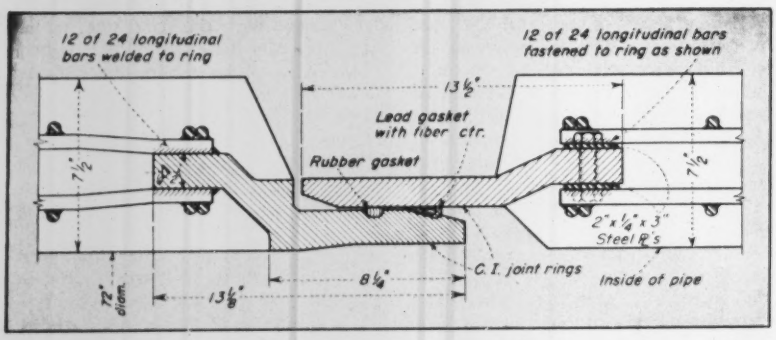


CONCRETE PIPE for extending 72-in. dia ocean outfall off the southern California coast has two diffuser holes in each 24-ft length. The purpose of the work is to carry sewage to a 150-ft depth.

Deepest ocean outfall for sewage diffusion



STRONG-BACK permits placing two 24-ft pipe lengths at one time. This reduces underwater time for construction divers working at the 150-ft depth.



JOINT DETAIL—of vital importance in ocean outfalls—shows use of both rubber and lead gaskets . Joint rings on molybdenum and chromium alloyed cast-iron are bolted to steel plate that is welded to pipe reinforcing.

A 72-in. dia, mile long, sewage outfall on the southern California coast is being extended an additional 1,800 ft where the greater depth—together with special diffuser holes in the pipe—will result in wider diffusion of the sewage. The outfall at present carries primary sewage effluent from the Los Angeles County Sanitation Districts to a 100-ft depth. The extension will permit discharge of the liquid waste in depths exceeding 150 ft—believed to be the deepest ocean outfall yet built.

The outfall is located at a coastal point where currents generally carry the sewage along or away from shore. But flow in the system is increasing rapidly, and sampling surveys have shown evidence of sewage contamination in the discharge area near the 72-in. outfall and a parallel 60-in. outfall 200 ft away. Accordingly officials in looking to the future are seeking better diffusion of the effluent that has been subjected to primary treatment only. They believe diffusion will obviate more complete land treatment at some future date.

The outfall extension terminates in two 48-in. lines, each 200 ft long and separated by a 120-deg arc. On the last 226 ft of 72-in. pipe and on the 48-in. pipe special holes are located at 24-ft intervals on each side of the pipe. These holes are so shaped that the sewage is expected to jet into the ocean waters. Dispersion of the sewage over a relatively wide area in small quantities should result in its being cooled to below the temperature of the ocean

surface before it reaches the surface. Thus, there is the distinct possibility that there will be no surface evidences of the outfall. (See density currents story, ENR Dec. 17, p. 31.)

• **Construction techniques**—Procedure for laying the pipe in the deep water is generally similar to that followed for the original 72-in. line more than five years ago (ENR March 4, 1948, p. 88). However, a major difference is that two 24-ft lengths are joined together on the deck of the placing barge. A strong-back made of steel angles holds them tight as they are lowered to the ocean bottom. They are positioned underwater by maneuvering the barge with power coming from winches pulling on anchor lines extending from the four corners of the barge. Seating power comes from a winch located on shore and controlled from the barge by radio.

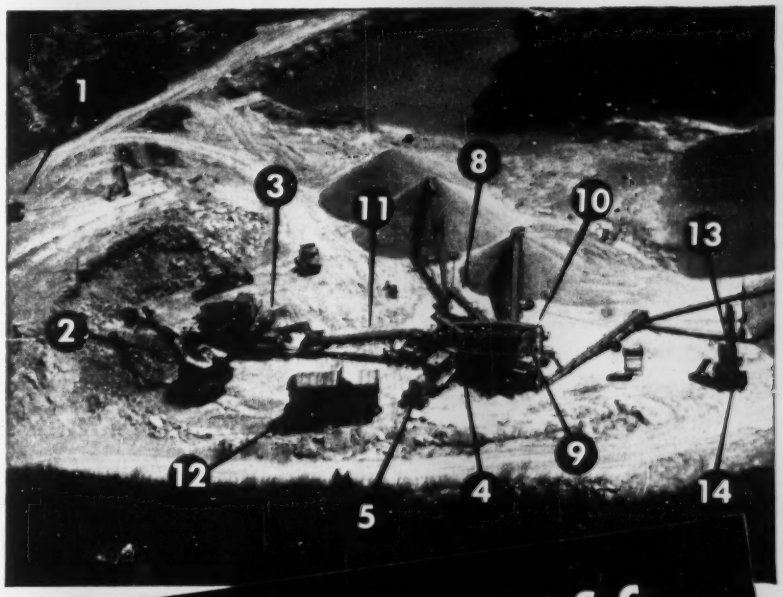
The strong-back and pipe laying sequence is worked out for minimum underwater work by construction divers. Depth is such that safety considerations restrict divers to two dives during a 24-hour period, one of 45 minutes duration and the other of 25 minutes. Normal length of time for positioning and seating a double length of pipe is within the 45-minute limit.

There are two divers on the job. One positions the pipe and returns to the surface. The other forces the lead gasket joint caulking material in by pneumatic hammer. This requires that two decompression chambers be provided on the barge.

The pipe is laid directly on the relative firm sandy ocean bottom. Gravel, of 1½-in. size will be tremied under each side of the pipe up to the spring line as a means of preventing scour along the pipe.

• **Joint detail**—On every ocean outfall there seems to be further refinement of the joint detail. In this instance a molybdenum and chromium alloyed cast iron joint was used as in the original work. But, a rubber gasket was added to assure tightness during placing and prior to seating a lead gasket between the cast iron end rings. And the cast iron rings are bolted to steel plates that are in turn welded to the reinforcing cage of the concrete pipe.

The work is being done by the Los Angeles County Sanitation Districts on a force account basis using supervisory employees who have worked on the 60-in. outfall and the original 72-in line. A. M. Rawn is chief engineer and general manager of the districts. Lester Haug is resident engineer. Dan Boom who was construction diver on the 60-in. line is construction superintendent on the 72-in. line extension as he was on the original 72-in. line.



TWIN DISC

14 Drives in action!

Typical example of powered equipment in modern industry is Stoneridge Limestone Company's aggregates plant near Rochelle, Ill. And typical example of Twin Disc's *complete range* of Friction and Hydraulic Drives is the aerial photograph above of the Stoneridge operation. Nine of the Twin Disc Drives were built-in by the original equipment manufacturer . . . five were installed by Stoneridge.

Whether built-in or added for extra performance, Twin Disc Drives have the *right design, construction and capacity.* See your Authorized Twin Disc Hydraulic Dealer.

And here they are . . . count 'em!

Twin Disc Spring-Loaded Clutch on International-powered LeRoi Compressor (1).

Twin Disc Friction Power Take-Offs on Cummins-powered Bay City Shovel (2); Caterpillar-powered Universal Jaw Crusher (3) and Universal Hammer Mill (4); and on Minneapolis-Moline-powered Pioneer Roll Crusher (5).

Twin Disc HYDRO-SHEAVE® Drives on Stoneridge-built horizontal conveyor (8); Simplicity Vibrating Screen (9); Pioneer Vibrating Screen (10); and Stoneridge-built Conveyor (11).

Twin Disc Hydraulic Coupling on Hercules-powered generator plant (12).

Twin Disc Friction Clutches (two each) on Nelson P-10 Loader (6, 7; not shown); and Nelson P-11 Loader (13, 14).

TWIN DISC

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

WEATHER

THE 30-DAY FORECAST of the U. S. Weather Bureau for the period from mid-December 1953 to mid-January 1954 calls for temperatures to average above normal in the western third of the country and also in the Northeast and lower Great Lakes. Below normal temperatures are indicated in the South and the Midwest. In other areas temperatures are expected to average not far from seasonal normals.

Precipitation in excess of normal is anticipated over and east of the Appalachians and along the Gulf Coast. Subnormal amounts are expected west of the Continental Divide and in the Middle Mississippi Valley, with near-normal elsewhere.

OBSERVED PRECIPITATION AND TEMPERATURE IN 20 CITIES, COMPARED WITH NORMALS

	Precipitation, inches				Temperature, degrees F.			
	Nov. 1953	Departure fr. normal	11 mos. 1953	Departure fr. normal	Mean Nov. '53	Departure fr. normal	Av. daily Maximum	Av. daily Minimum
Atlanta	1.35	−2.06	44.39	−0.71	52.7	+0.8	63.7	41.6
Baltimore	1.50	−1.46	45.81	+6.17	49.7	+1.0	57.8	41.6
Birmingham	1.62	−2.36	40.92	−7.35	51.6	−0.4	66.0	37.2
Boston	7.66	+4.17	52.64	+17.25	48.6	+4.2	55.8	41.3
Chicago	1.77	−0.56	27.05	−3.72	44.4	+4.9	52.5	36.2
Cincinnati	1.30	−1.76	25.76	−10.61	46.1	+1.5	56.0	36.2
Cleveland	2.32	−0.34	29.54	−0.25	45.2	+2.5	52.8	37.7
Dallas	2.77	+0.34	23.60	−8.20	54.5	−1.3	64.6	44.3
Denver	.82	+0.10	11.92	−1.01	44.6	+3.3	55.7	33.4
Detroit	.83	−1.35	22.51	−6.32	44.5	+4.4	51.0	38.0
Kansas City	1.10	−1.07	19.10	−14.71	47.3	+3.0	56.4	38.2
Los Angeles	1.11	+1.08	4.00	−6.43	63.6	+1.5	73.4	53.8
Minneapolis	1.64	+0.10	26.28	+0.10	39.3	+6.3	48.3	30.2
New Orleans	11.70	+7.69	63.93	+4.97	61.6	−0.9	69.2	54.0
New York	2.41	−0.68	42.25	+3.29	49.4	+3.1	56.1	42.7
Philadelphia	1.84	−1.24	45.57	−7.11	49.3	+1.5	56.8	41.8
Pittsburgh	1.25	−1.36	29.70	−4.63	46.9	+2.3	55.3	38.5
St. Louis	0.84	−1.88	21.68	−11.15	49.0	+3.0	58.2	39.8
San Francisco	1.88	−0.39	11.83	−4.61	56.7	−0.5	61.7	51.6
Seattle	6.01	+1.55	34.82	+8.07	49.7	+2.7	54.6	44.8

PRECIPITATION RANGE IN 20 CITIES, IN INCHES

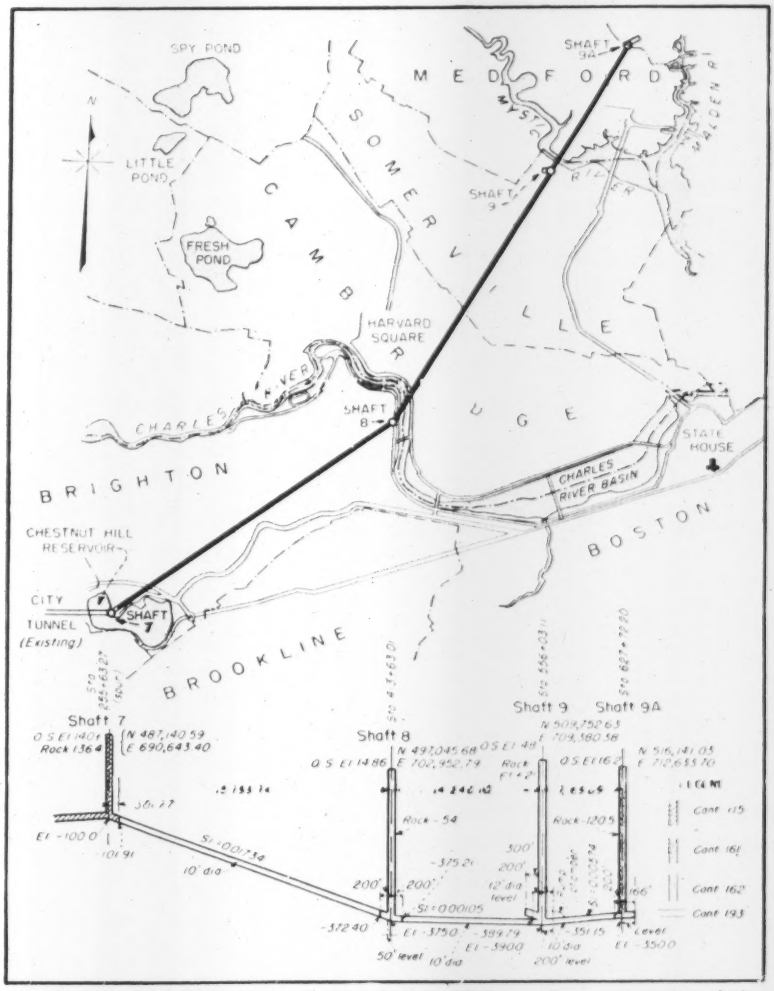
Table shows range observed 33.3% of time. Rainfall heavier 33.3% of time, lighter 33.3% of time.
Computed by U. S. Weather Bureau (based on historical records of actual precipitation)

City	Dec.	Mid. Dec.–Mid. Jan.	Jan.	Mid. Jan.–Mid. Feb.	February	Mid. Feb.–Mid. Mar.	March	Mid. Mar.–Mid. Apr.	April	Mid. Apr.–Mid. May	May	Mid. May Mid. June	June	Mid. June–Mid. July
Atlanta	3.46/5.30	3.42/5.32	3.39/5.33	3.38/5.50	3.36/5.67	3.40/6.00	3.43/6.33	3.12/5.72	2.82/5.10	2.48/4.72	2.14/4.33	2.50/4.38	2.87/4.43	2.93/4.62
Baltimore	2.41/3.73	2.59/3.85	2.77/3.96	2.57/3.64	2.36/3.39	2.48/3.76	2.59/4.13	2.59/4.17	2.58/4.20	2.76/4.30	2.94/4.40	2.73/4.42	2.52/4.44	2.57/4.71
Birmingham	3.71/5.75	3.75/5.58	3.75/5.40	3.61/5.64	3.47/5.88	4.18/6.26	4.48/6.63	3.91/5.85	2.94/5.07	3.05/4.81	3.16/4.55	2.90/4.70	2.64/4.84	3.29/5.18
Boston	2.89/4.20	2.83/4.12	2.77/4.05	2.70/3.99	2.64/3.93	2.79/4.22	2.94/4.50	2.66/4.45	2.39/4.40	2.58/4.29	2.76/4.18	2.42/3.84	2.09/3.50	2.35/3.76
Chicago	1.32/2.45	1.30/2.28	1.29/2.10	1.40/2.16	1.52/2.23	1.76/2.67	1.99/3.11	2.09/3.12	2.19/3.13	2.24/3.56	2.16/4.00	2.29/3.88	2.42/3.67	2.46/3.66
Cincinnati	2.29/3.28	2.32/3.54	2.34/3.80	2.07/3.40	1.80/3.00	2.10/3.64	2.39/4.29	2.66/3.94	2.34/3.60	2.42/3.85	2.49/4.10	2.59/4.30	2.69/4.50	2.54/4.10
Cleveland	1.70/2.56	1.65/2.58	1.59/2.60	1.55/252	1.51/2.43	1.81/2.71	2.10/2.98	2.15/3.13	2.20/3.27	2.27/3.38	2.33/3.49	2.17/3.53	2.00/3.56	2.24/3.82
Dallas	1.09/3.00	1.24/3.05	1.39/3.10	1.49/2.70	1.59/2.30	1.96/3.08	2.34/3.86	2.50/4.68	2.66/5.50	2.82/5.38	2.99/5.25	2.39/4.85	1.79/4.45	1.59/3.72
Denver	0.39/0.77	0.28/0.64	0.18/0.50	0.26/0.54	0.34/0.58	0.46/0.84	0.59/1.10	0.96/1.75	1.34/2.40	1.48/2.65	1.62/2.90	0.64/2.32	0.67/1.75	0.94/1.88
Detroit	1.64/2.60	1.63/2.50	1.62/2.40	1.56/2.45	1.51/2.50	2.14/2.64	1.77/2.78	1.78/2.76	1.79/2.73	2.14/3.20	2.49/3.67	2.66/3.88	2.84/4.10	2.46/3.90
Kansas City	0.77/1.55	0.68/1.48	0.59/1.42	0.80/1.66	0.99/1.90	1.29/2.40	1.59/2.90	1.99/3.15	2.39/3.40	2.82/4.40	3.24/5.40	3.42/5.82	3.61/6.25	3.19/5.47
Los Angeles	1.14/2.70	1.19/3.00	1.24/3.30	1.12/3.25	0.99/3.20	1.06/3.08	1.13/2.95	0.68/1.92	0.22/0.90	0.14/0.62	0.05/0.35	0.02/0.18	0.00/0.02	0.00/0.01
Minneapolis	0.57/1.30	0.60/1.19	0.64/1.08	0.58/1.08	0.52/1.08	0.75/1.38	0.98/1.67	1.34/2.14	1.69/2.60	2.16/3.29	2.64/3.98	2.89/4.49	3.14/5.00	2.64–4.50
New Orleans	3.24/5.17	3.36/5.28	3.49/5.40	3.14/5.05	2.79/4.70	3.00/5.00	3.22/5.30	2.94/5.15	2.66/5.00	2.65/5.12	2.64/5.25	3.18/5.88	3.72/6.50	4.54/6.95
New York	2.64/3.77	2.55/3.71	2.46/3.65	2.41/3.88	2.36/4.10	2.35/4.08	2.34/4.05	2.40/3.92	2.47/3.78	2.50/3.90	2.54/4.02	2.45/3.91	2.36/3.80	2.81/4.25
Philadelphia	2.64/3.90	2.60/3.80	2.57/3.70	2.57/3.69	2.57/3.68	2.60/3.84	2.62/4.00	2.56/3.91	2.49/3.82	2.44/4.11	2.39/4.40	2.54/4.25	2.69/4.10	2.94/4.24
Pittsburgh	2.09/3.27	2.21/3.20	2.14/3.13	1.96/2.98	1.77/2.83	2.06/3.15	2.34/3.47	2.32/3.44	2.29/3.40	2.39/3.58	2.49/3.75	2.68/3.98	2.86/4.20	2.79/4.35
St. Louis	1.64/2.80	1.52/2.75	1.39/2.70	1.48/2.80	1.57/2.90	1.92/3.42	2.27/3.95	2.43/3.88	2.59/4.10	2.86/4.65	3.13/5.20	2.96/5.25	2.79/5.30	2.60/4.78
San Francisco	2.19/5.25	2.34/5.12	2.49/5.00	2.24/4.86	1.99/4.71	1.96/4.13	1.94/3.55	1.30/2.54	0.67/1.54	0.44/1.12	0.18/0.69	0.09/0.37	0.00/0.05	0.00/0.03
Seattle	4.17/5.89	4.14/5.57	4.12/5.25	3.34/4.92	2.55/4.60	2.18/4.02	1.81/3.43	1.72/3.16	1.64/2.90	1.53/2.45	1.42/2.00	1.09/1.88	0.76/1.73	0.48/1.20

MEAN TEMPERATURE RANGE IN 20 CITIES, IN DEGREES F.

Table shows range observed 25% of time. Mean temperature higher 37.5% of time, lower 37.5% of time.
Computed by U. S. Weather Bureau (based on historical records of actual temperature)

City	Dec.	Mid. Dec.–Mid. Jan.	Jan.	Mid. Jan.–Mid. Feb.	February	Mid. Feb.–Mid. Mar.	March	Mid. Mar.–Mid. Apr.	April	Mid. Apr.–Mid. May	May	Mid. May–Mid. June	June	Mid. June–Mid. July
Atlanta	44.0/46.0	43.3/45.3	43.5/45.5	44.0/46.4	45.1/47.9	47.5/50.1	51.2/53.6	55.9/58.0	60.9/62.6	64.9/66.5	69.0/70.5	73.5/74.6	77.3/78.1	78.5/79.3
Baltimore	35.8/37.8	32.2/36.1	33.9/35.7	33.4/36.0	34.6/38.0	38.1/41.7	42.0/45.7	46.6/49.4	51.9/53.6	57.5/59.0	63.4/64.6	68.2/69.5	72.5/73.8	75.2/76.6
Birmingham	44.3/46.5	43.4/46.1	43.5/46.5	44.4/47.6	46.0/49.4	48.8/5.17	52.4/54.7	56.6/58.5	61.1/62.6	64.6/66.3	68.4/70.2	72.4/74.5	76.8/78.1	78.4/79.7
Boston	31.2/34.0	28.9/31.9	27.9/31.2	26.4/29.6	27.8/30.0	31.4/34.0	35.6/38.6	41.1/43.3	46.7/48.3	51.5/53.1	56.7/58.4	56.8/58.6	66.3/68.1	69.6/71.1
Chicago	28.7/30.3	23.7/28.5	23.2/28.1	23.1/28.1	24.7/30.0	29.2/34.2	34.6/39.1	40.9/43.8	47.5/48.8	52.7/54.7	57.9/60.5	63.1/66.1	68.0/71.2	71.6/74.0
Cincinnati	31.4/35.2	30.1/34.4	29.8/34.6	29.9/34.4	31.6/36.0	35.2/39.2	39.6/43.1	45.4/48.1	51.4/53.3	56.4/58.6	61.5/64.0	66.7/68.9	71.2/73.0	73.4/75.2
Cleveland	29.3/32.9	27.3/30.9	26.9/30.5	26.0/29.6	26.2/29.7	29.8/33.7	34.7/38.8	40.3/43.2	46.2/47.8	51.8/53.9	57.9/60.3	63.5/65.7	68.2/70.2	71.2/73.0
Dallas	47.0/49.3	44.8/47.1	44.1/47.5	45.8/49.2	48.8/52.2	51.9/55.6	55.5/59.6	60.1/63.7	64.2/67.3	68.4/71.1	72.8/75.0	77.2/78.8	81.1/82.2	83.3/84.6
Denver	30.5/33.5	28.3/31.4	27.0/30.0	27.9/31.5	30.5/34.7	33.1/36.8	35.9/39.1	40.4/43.2	46.3/48.6	51.1/53.4	55.2/57.4	60.0/62.1	65.4/67.5	69.7/71.5
Detroit	27.9/30.9	25.6/28.5	24.8/27.7	24.2/27.8	24.6/28.9	27.9/32.1	33.1/37.2	39.3/42.1	45.6/47.1	51.0/52.8	56.5/58.7	62.3/64.4	67.3/69.4	70.6/72.1
Kansas City	32.4/35.9	30.4/33.0	30.0/31.9	30.2/33.6	32.2/37.1	37.3/41.2	42.9/45.9	48.6/51.3	54.9/56.7	59.9/61.7	64.6/66.4	69.4/71.2	74.2/76.0	78.0/79.6
Los Angeles	54.9/56.5	53.4/54.8	52.7/54.0	52.6/54.3	52.9/55.1	54.1/56.3	55.4/57.4	56.6/58.4	58.1/59.7	59.8/61.3	61.4/62.8	62.5/64.0	63.9/65.4	65.4/67.0
Minneapolis	16.2/22.3	13.8/18.4	13.4/16.5	13.3/17.7	15.0/20.8	21.7/25.9	29.9/32.5	37.3/40.3	44.7/47.9	51.3/54.4	57.2/60.2	62.2/64.9	66.6/69.1	70.3/72.5
New Orleans	54.6/56.8	53.2/56.0	52.6/56.0	54.0/54.4	55.9/59.3	57.6/60.8	60.6/63.0	63.4/65.7	67.4/69.1	70.7/72.1	73.8/74.9	77.0/78.1	79.9/80.9	81.0/81.9
New York	34.6/37.5	32.5/35.2	32.0/34.6	30.9/33.6	30.9/33.6	34.1/36.8	38.7/41.3	43.6/46.0	49.0/51.0	54.6/56.3	60.6/62.1	65.9/67.5	70.4/72.2	73.6/75.0
Philadelphia	35.1/37.3	32.7/35.4	31.8/35.0	31.1/34.3	32.3/35.3	36.4/39.2	40.8/43.5	45.6/47.9	50.8/52.6	56.2/58.0	62.3/64.0	67.5/69.2	71.5/73.1	74.1/75.4
Pittsburgh	29.8/32.6	27.8/31.0	26.9/30.1	26.4/30.5	26.9/32.0	30.5/35.4	36.0/40.6	43.3/46.5	48.0/49.8	53.1/55.1	58.7/60.9	63.5/65.8	67.4/69.7	70.2/72.0
St. Louis	33.3/37.1	30.9/35.1	30.1/34.7	31.3/35.7	33.7/38.1	37.8/41.8	42.9/46.3	48.6/51.5	54.5/57.0	58.4/61.9	64.0/66.6	68.7/71.5	73.5/76.2	76.9/79.0
San Francisco	48.7/50.2	47.1/48.9	46.9/49.1	48.3/50.8	50.6/51.7	51.0/52.8	51.7/53.5	52.4/54.2	53.2/55.0	54.3/55.9	55.9/57.4	57.5/59.1	58.8/60.5	59.6/61.0
Seattle	39.4/40.7	37.7/39.0	37.2/38.5	38.2/40.0	39.7/42.0	41.7/43.3	43.6/44.7	45.8/47.2	48.2/49.9	51.0/52.9	54.2/56.3	56.9/58.5	59.3/60.4	61.7/62.7



PLAN AND PROFILE—Shafts 8, 9, and 9-A will be used as construction shafts. Number 7, in use for distribution of water, will not be used for construction.

Award contracts for 7-mi water tunnel

Extension to Boston Metropolitan District system will supply half of the present daily demand

Contracts for the construction of a 7-mile water tunnel (ENR Feb. 19, p. 154) in the Metropolitan Boston area have been awarded by the Metropolitan District Commission to Morrison-Knudsen of New York. The $12-million project will require an estimated construction period of three and one half years and will provide an average employment of about 500 men.

Governor Herter of Massachusetts has said that the tunnel will greatly improve the water supply and distribution situation in the communities of the northern half of the MDC water system through lessening of their dependence upon old mains that have become incapable of meeting growing demands.

The tunnel capacity of 100 mgd will supply about half of the present daily demand of the MDC system, but during peak summer-time consumption, the total use increases as much as 50 mgd.

The route cuts through deep rock in portions of Boston, Cambridge, Somerville, Medford and Malden. The structure will be 10 ft in finished diameter and lined with concrete with a minimum lining thickness of eight in. Depths will range from 250 to 440 ft below the surface.

Already three shafts have been completed under previous contracts. Shaft 8 in Brighton is 390 ft deep with a 14-ft diameter; shaft 9 is 440 ft deep and elliptical in shape, with major and minor axes of 24 and 19 ft, respectively. Shaft 9-A in Malden is 366 ft deep and 14 ft in diameter.

The tunnel will be driven from Shafts 8, 9, and 9-A. Shaft 7 in Chestnut Hill, is now in operation and is therefore not to be used as a construction shaft. Shaft 9, in Somerville, will be a de-watering shaft, with provisions for de-watering the tunnel at that point.

The main distribution shaft will be Shaft 9-A, but provision will be made for connections with existing mains at all shafts.

The project was designed, and the plans and specifications for the contract were prepared by the engineering organization of the Construction Division of the MDC; Frederick W. Gow, Chief Engineer; Martin F. Cosgrove, Asst. Chief Engineer, and Chester J. Ginder, Design Engineer.

Albuquerque in record boom with 1,500 homes in works

Led by a 31-year-old homebuilder, Albuquerque, N. M., is enjoying the greatest spurt of construction in its history, despite the drying up, six months ago, of available mortgage money and the consequent halt in activity at that time.

Edward H. Snow started work last month on a $10-million, 1,150-unit project on a 320-acre tract which is a part of 640 acres he bought recently from Dr. W. Randolph Lovelace for some $1.25 million.

The site is 12 mi from the center of the city, near a 350-home project Snow is completing. Some 20,000 persons attended Snow's opening-day ceremonies, looked at four model homes, and, by sundown, had purchased 100 homes.

The houses are of frame construction on concrete slabs with two, three, or four bedrooms, and sell at $6,865 to $9,850.

Other Albuquerque builders who have announced new projects are Joe Weeks Construction Co., 300 homes; and Dale Bellamah, 79 homes.

(*Municipal continued on page 42*)

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Authority plans $360-million project

Transformation of 3,300 acres of swamp and blighted area into a well balanced city of 45,000 is planned

The Philadelphia Redevelopment Authority has announced the completion of a master plan for what it claims to be the largest redevelopment project ever undertaken in the United States.

Called the Eastwick Project, the $360-million residential-commercial undertaking will create a city within the city of Philadelphia that will accommodate 45,000 inhabitants.

The plan to transform a marshy wasteland in the southwestern area of the city into a garden spot has been turned over for study to the city and the federal government which, with private capital, will finance the undertaking. Included in the plan are modern apartments, homes, shopping centers, parks, a trolley and bus terminal, plus facilities for off-street parking to provide for every resident owning an automobile.

Eastwick at present is a 3,300-acre wedge in the city's extremity, bounded on the south by the Philadelphia International Airport. The project to reclaim the "meadows", as the area is called, was first conceived three years ago by the city's Planning Commission.

It has now reached the blueprint stage for study by the commission, city council, the mayor, and eventually the federal government.

• **Public support**—For several decades various civic groups have been waging a campaign for public agencies to rescue this blighted area in which 2,700 families live, some without sanitary facilities or drainage.

Some sections of Eastwick are 12 ft below the tidewaters of the Delaware River, and there is an estimated tax deliquency of 80% on ground parcels and 40% on dwellings, some dating back as far as city records are available.

Details for the project, prepared by Henry S. Churchill, architect and consulting planner, call for the area to be filled in with 10 million cu yd of silt from the Schuylkill and Delaware Rivers as an adjunct to the clean streams program. Sewers will be installed and streets built. Old marshlands that are unfit for any use will disappear and in their place will rise 12,600 new dwellings with 60 acres for commercial use, 85 acres for schools and 432 acres for parks.

• **Parking provisions**—Churchill and Francis J. Lammer, executive director of the PRA, explained the project, which calls for 4,100 apartment units, 7,800 row homes and 690 semi-detached or single dwellings, all constructed to eliminate the urban automobile parking problem and increase the flow of traffic.

Churchill emphasized that it will be an integrated community with many of the dwelling units planned for low-income groups, but encouraging construction of homes of upper-middle class design.

Homes and apartments will face interior streets, leaving through-routes open to traffic, particularly those feeding the proposed Delaware Expressway.

Residents living in the apartments and owning cars will be required to use parking compounds or garages operated by the City Traffic Authority. Five shopping centers are planned—one large and four smaller ones. They will be centrally located and near new fire, police and first aid stations.

Light industries will be encouraged to utilize 1,009 acres provided, while 254 acres of existing industrial development will be retained. Other features include construction of a major transportation terminal for bus and trolley lines.

Lammer said the city and the Planning Commission will require three months to study the proposed project after which, if approved, it will be sent to Washington for federal study and approval.

Cost of initial land preparation, including land fill, sewers, streets and other utilities, is estimated at $15 million (market value of land and buildings in the area at present time is $21 million).

Lammer said that the federal government might furnish all of the money for the improvement of the ground and acquisition of property by allowing credits for schools and public buildings.

Construction of buildings is expected to be done by private builders under HHFA commitments (Two private syndicates have evinced interest in this phase of the program).

• **Assessments may jump 1000%**—Lammer said that estimates indicate that the project will increase the tax

yield from $300,000 to $3 million annually. The federal government, through the Slum Clearance and Redevelopment Division of the housing agency, has allocated nearly $3 million to pump silt into the tract, with operations starting in January.

The Pennsylvania State Department of Forests and Waters, in cooperation with the U. S. Army Engineers, has awarded contracts for pumping silt from the Schuylkill over a 12-mile course to the project site.

The Eastern Engineering Co., which has the contract, will use three dredges, according to Raymond E. Kellner, company superintendent, pumping silt from the river into a 16-inch pipe that will feed a 27-inch line laid along the west side of the river on pontoons.

Capital's building program needs approval of Congress

Washington, D. C., in the unique position of being the only city in the country that is forced to take its public works problems to the Congress of the U. S., finds itself away behind on projects needed to keep pace with the vast population growth in recent years.

The capital city officials and business boosters are pushing a 10-year, $306-million construction program in an effort to build badly needed schools, hospitals, sewers, highways and other facilities.

But despite agreement by the Budget Bureau to approve the 10-year plan, it must receive the sanction of the two houses of Congress, Washington's "city council."

An earlier program, submitted two years ago, ran into objections from congressional leaders of the powerful district committees, as well as the Budget Bureau, but a citizens' committee—with the strong support of the Board of Trade—is hopeful that the selling job they have been doing will pay off.

A bill proposing the modified program will be introduced early in the next session, and House and Senate committees have promised early hearings.

Under a new financing plan, added district revenues in ten years will pay a third of the cost of the program, increased federal contributions will take care of another third, and most of the remainder will be financed out of $90 million in treasury loans.

The current proposals are easily the largest district request that Congress has been asked to approve since it passed a sales tax bill that took effect in 1950.

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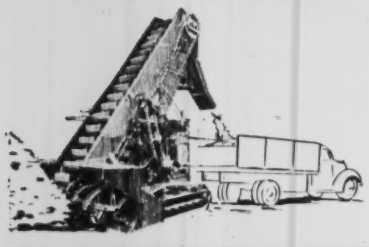

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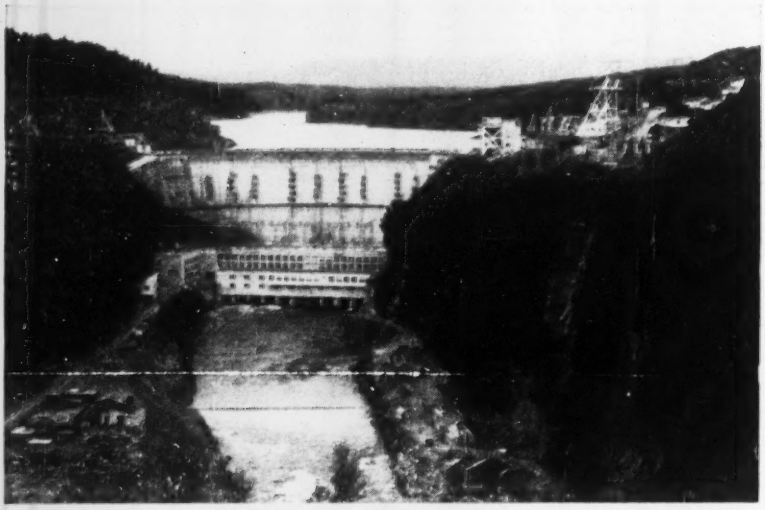
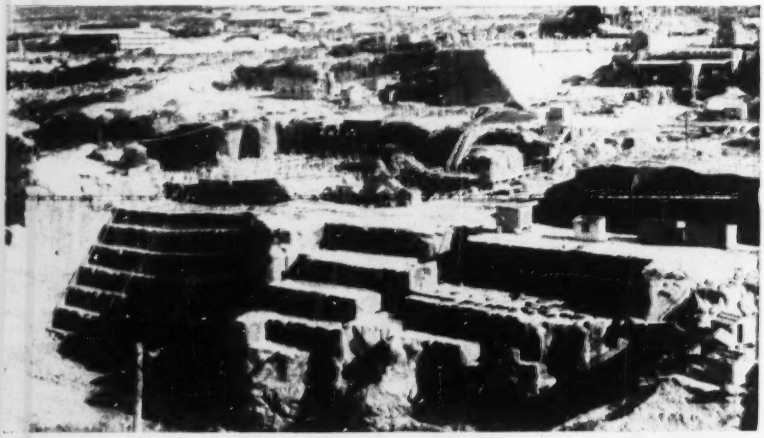


MARAETAI DAM, North Island, New Zealand, is the third major structure to be finished on the projected 800,000-kw Waikato River hydroelectric development.



VOLCANIC ROCK, at Whakamaru Dam, is typical of the bed rock conditions on the Waikato River dam sites. Contraction fractures in the rock were grouted to 200 ft below dam foundations and as much as 1,000 ft horizontally out from the abutments.

Major hydro development progresses on New Zealand's North Island

With the completion this year of the 180,000-kw Maractai hydroelectric station, New Zealand's 10-dam Waikato River development (ENR Dec. 19, 1946, p. 4) reached the halfway point of its potential power output. Started before the war, the Waikato hydro plant will produce 800,000 kw when completed.

To date three dams—Arapuni, Karapiro, and Maractai—of the ten in the project have been put in operation. The Whakamaru Dam, just above Maractai, is under construction and will bring in 100,000 kw when completed in 1956. Waipapa, a 55,000-kw installation to be built just below Maractai, is the next dam slated for construction.

The Arapuni Dam was the first structure to be completed in the project, and it went into operation in 1947 with an installed capacity of 160,000 kw. Fifteen miles downstream on the Waikato River the Karapiro Dam was the next to go into operation in 1949 with an installed capacity of 90,000 kw.

Generating capacity of New Zealand's North Island will be increased by 40% in harnessing the Waikato all the way from its source to the sea. When completed, the plan's ten dams will take advantage of the Waikato's 1,100-ft drop in 125 miles. Huka Dam at the headquarters near Lake Teupo, will back up a lake at an elevation of 1,172 ft. Working downstream from Huko Dam there will be Aratiatia, Parariki, Ohakuri, Atiamuri, Whakamaru (under construction), Maraetai (completed), Waipapa (next to be built), Arapuni (completed), and Karapiro Dam (completed) with its lake at an elevation of 170 ft.

World Bank to survey needs of Malaya's economy

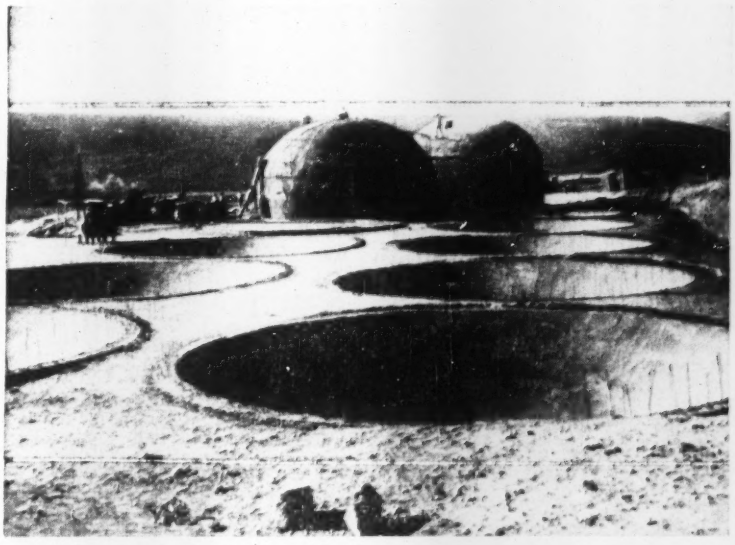
A mission of the International Bank for Reconstruction and Development will make a full survey next year of Malaya's need for national development, according to a report in the newspaper Singapore Standard. The report cites the projected construction of a 100,000-kw hydro program in the Cameron highlands along with an electrical facilities expansion for the whole country.

Of significance to the country's redevelopment prospects, the port of Singapore is in an initial stage of extensive development. Work is about to start on a 600-ft, $1.6-million pier that will accommodate most ocean-going vessels. A subsidiary of J. C. Gammon, Ltd., England, has the contract for the pier.

Cuban unions to build hotel, housing project

An agreement has been signed between the Cuban Culinary Workers Union and the Hilton Hotels International for the construction of an $11-million hotel in Havana. And the Bus Workers Union has announced plans to construct a $4.4-million, thousand-home development in Havana for its members.

Construction on the 22-story hotel will start next year. The structure will feature terrace-access for every room and a 500-car subterranean garage. Architect for the hotel is Welton Becket & Associates, Los Angeles.



Rubber-balloon forms

Concrete igloo-like structures formed by spraying concrete on an inflated rubber balloon in Amman, Jordan, will be used for storing grain. The wire mesh reinforced structures are each capable of holding 500 tons of grain. Bottom segments of bins were formed first with a templet, and then the balloon was used for the upper portion. The Jordanian government plans to erect similar storage installations near Irbed, Karak, and Nablus. Estimated cost of the ten bins and all equipment for grain handling is $170,000. International Airform Construction Corp., New York, is the contractor.

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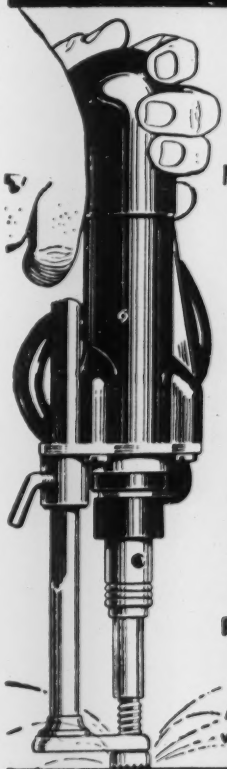

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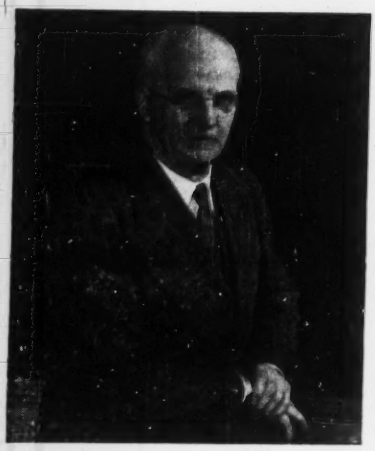


C. J. Mackenzie wins Kelvin Medal

Dr. C. J. Mackenzie, recently retired president of Atomic Energy of Canada, Ltd., has been awarded the Kelvin Medal for outstanding service in the field of engineering.

The medal is awarded once every three years on the joint recommendation of the presidents of eight leading British engineering institutions. To date eight awards have been made. They went to Guglielmo Marconi of Italy; Blondel of France; Elihu Thomson and Theodore von Karman of the United States; Dr. Raymond Unwin, Sir J. A. Fleming, Air Commodore Whittle and Sir Charles Parsons of England.

Dr. Mackenzie's retirement, Oct. 31, from Atomic Energy of Canada had been regarded as bringing to an official close one of the most distinguished engineering careers in Canada, although Dr. Mackenzie will continue to serve that organization in a consulting capacity and to remain as chairman of the Atomic Energy Control Board of Canada. The founder and for about thirty years the Dean of the College of Engineering at the University of Saskatchewan, Dr. Mackenzie carried out as a consultant some notable engineering works in the west of Canada, the Broadway Bridge, Saskatoon, being an outstanding example.

In 1939, after being a member of the National Research Council for some years, he was called to Ottawa to be acting-president of the operating laboratories of the council in Ottawa, consequent upon the departure of the then president, General A. G. L. McNaughton, to command the Canadian Army in Europe. Under Dr. Mackenzie's direction, the staff of the N.R.C. expanded, during the war years, from about 300 to over 3,000, with about thirty research establishments in operation all over the Dominion at the end of hostilities.

Dr. Mackenzie was responsible for all of Canada's defense research work up to 1946. Correspondingly, he was responsible for Canada's work in the atomic energy field. It was under his direction that the National Research Council established, in 1947, its Division of Building Research which has now advanced in its development to the point of having its own building in use.

Career briefs . . .

• **Texas traffic engineer**—Bill Miller, Fort Worth's acting traffic engineer since the resignation of T. R. Buckman, has taken over the post on a permanent basis. He worked as a civil engineer until 1948 when—after attending Yale University's Bureau of Highway Traffic—he went to the Texas city to fill the position of assistant traffic engineer.

• **New Mexico move**—John Erickson, formerly New Mexico's interstate stream engineer, has been named state engineer. His career includes service with the following: the U. S. Geological Survey, the Colorado state engineer and the Colorado Water Conservation Board.

• **Far East assignment**—Lt. Col. I. R. Wanke, executive officer of the Norfolk, Va., district, Corps of Engineers, is being re-assigned to duty with the Armed Forces in the Far East. His Norfolk duties will be taken over by Lt. Col. J. C. Chesley, who has been attached to that district for the last six months.

• **Efficiency expert**—James Kezer, a Bureau of Reclamation engineer since 1946, has been cited for devising a system to prevent losses of power on the Colorado-Big Thompson project—a system that saved the government $45,000 over an 18-month period. Reclamation officials explain Kezer's method: "He used one unit of the Estes power plant as a synchronous condenser with turbine disconnected from the generator, which had the effect of balancing the voltage in the bureau's power system throughout northeastern Colorado and southeastern Wyoming."

OBITUARIES

Stephen O. Kohout, 58, construction superintendent for George A. Fuller Co., died Dec. 7 at Washington, D. C. He had been with the Fuller Company for 33 years and had taken part in the erection of many projects in the capital area, including the Archives, Senate Office, and Federal Reserve Board buildings in Washington, D. C.

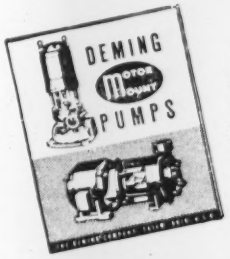
John F. Partridge, 62, Chief of Tennessee Valley Authority's construction plant branch, died recently in Knoxville, Tenn. A graduate C.E. of Stanford University, 1912, he served in both world wars, spent several years in California and Oregon on irrigation and hydro construction, also in Brazil, joined TVA in 1934, served as construction engineer on several dams, and since 1947 directed the construction plant planning for the Tennessee Valley Authority's accelerated construction program.

Otto Kubitz, 77, consultant engineer, died Dec. 6 at Baltimore, Md. He attended the engineering college of Charlottenburg, Germany, and emigrated to America in the mid-1890's. With the late Martin Koenig, Jr., he formed the firm of Kubitz and Koenig more than 30 years ago. It participated in design of many important Baltimore buildings, including the University Hospital, the May Company, public schools and other structures in the city, and also in the South and in South America.

Frank E. Bard, 59, a civil engineer employed in the water distribution bureau of Chicago since 1915, died Nov. 25.

James E. Womersley, 60, for 30 years city engineer of Akron, Ohio, died there Dec. 6.

Curtis H. Bradfield, 49, Coast Guard civil engineer and part-time Baltimore, Md., unofficial city planner, died Nov. 30. He attracted attention in 1946 with his plan for filling the inner harbor and constructing a throughway across it for Washington-Philadelphia traffic. A 1922 graduate of Baltimore Polytechnic Institute, Mr. Bradfield worked for the engineering department of the Baltimore & Ohio Railroad for five years, became a field engineer for the Western Electric Co. and, after six years in private work entered government employment in 1938 as a senior civil engineer at the Coast Guard yard.



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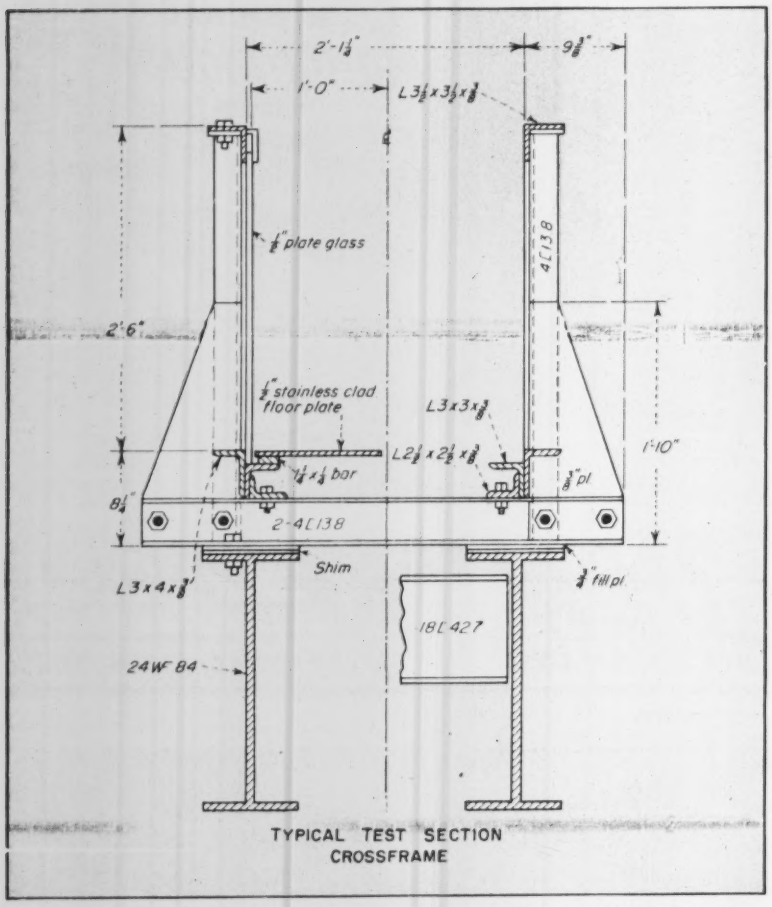


FLUME SUPPORT STRUCTURE insures negligible deflection under full load. Correction of point-gage measurements of depths of flowing water will not be necessary.

Research flume requires no deflection correction

An unusually rigid flume, with glass walls for study of channel hydraulics, is being installed in the Illinois State Water Survey's laboratory in Urbana. To be ready for use on research problems next year, the 58-ft 10-in flume is designed to deflect only 0.035 in. under full load.

Because of this unusual rigidity, measurements of depth of flowing water by point-gage methods will not require correction for flume deflection. Variance in point-gage measurements is estimated to be of the same order of magnitude as the deflection; at full depth the maximum possible error in depth measurement would amount to 0.25 percent. To meet the deflection standard, the tilting flume is supported by two 60-ft, 24 WF 84 beams.

A steel-plate stilling basin 3 ft long, 4½ ft wide, and 5 ft deep is mounted at the upstream end of the flume. Clear or sediment-laden water from a 12-in. line will discharge vertically into this basin and flow through corrugated stilling baffles into the transition section. Three cylindrical quadrants of 12-in. radius reduce the flow width and depth to 2.5 ft and 4 ft respectively. The side walls of the transition section then converge toward the axis of the flume at an angle of about 5 degrees until a 2-ft width is reached. The 2-ft width is maintained throughout the remaining length of the flume. The 4-ft depth ends 11 ft from the downstream end of the transition section. The remaining distance (40 ft 4 in.) consists of a test section 2 ft in depth.

Sluice gates at the downstream ends of both the entrance and test sections permit the flume to be used to demonstrate phenomena such as hydraulic jump, submerged orifice flow, weir flow, and sediment transport.

The transition design was based on results reported by Rouse, Hinds and Scobey for subcritical flow.

The upstream ends of the supporting beams are pivoted and the downstream supports consist of two motor-driven screw jacks which will allow a movement of 1 ft 5 in.

The two wide-flange beams supporting the glass-walled channel are cross-tied with 18-in., 47-lb channel diaphragms located on 8-ft centers. Dead-load deflection of the channel bed will be eliminated by shimming under the cross frames. The design live-load was taken as the force exerted by water when both the entrance and test sections were full, plus a 500-lb roving concentrated load. The most critical loading combination existed when the concentrated load (to simulate a model or a movable instrument cart) was placed between supports in the test section. The two simple beam supports were positioned to give minimum live-load deflection between the supports and at the end of the downstream cantilever. The supporting beams were then chosen to give the required 0.035-in. deflection. Top rail angles were selected to act structurally with the glass side walls and give 0.018-in. lateral deflection halfway between the cross frames with full live-load. Fabrication tolerances on members that could not later be adjusted to true alignment were set at ⅛-in.

Structural details of a typical test-section cross frame are shown in the drawing. The cross frames are bolted to the supporting beams on 5-ft 6-in. The floor plate shown has a 20 percent stainless steel covering. The ½-in. tempered glass side walls fit in rubber gasket recesses outside the floor plate so that the flow at the bottom of the channel may be observed.

Structural design was done by Prof. E. J. Daily of the University of Illinois, Civil Engineering Department. C. S. Johnson Company, a subsidiary of the Koehring Company, did the steel fabrication, and the flume is now being installed in the laboratory by C. A. Petry, general contractor.

Technical data on use of forest products ready

New research information in the fields of housing and general construction is contained in technical reports just issued by the U. S. Forest Products Laboratory, Madison, Wis.

"Rigidity and Strength of Frame Walls Sheathed with Fiberboard," Report No. 1151, by R. F. Luxford, Laboratory Engineer, describes a series of tests made on room-sized wall panels sheathed with fiberboard. The report includes data on the effects of nailing, storage in high humidity, wetting, openings in wall panels and vibrations in wall panels. Much of this data is compared with similar test data on walls sheathed with horizontal and diagonal wood sheathing.

A second report No. 1952, deals with research work on thermal conductivity of paper honeycomb cores and ways of improving their insulating value. Data on sound absorption of sandwich panels is also included.

A third paper, "Condensation Problems in Modern Buildings," by L. V. Teesdale describes many of the problems of condensation and offers some general recommendations for their solution. Report No. 1196, like the first two described, may be obtained free of charge from the Director, U. S. Forest Products Laboratory, Madison 5, Wis.

NBS conducts research on fire retardant paints

Fire retardant paints are the subject of a major research project at the National Bureau of Standards. Under development are a battery of tests to evaluate the limits of effectiveness of paints advertised or commonly accepted as fire retardant. It is expected that the bureau will arrive at a classification on the basis of fire resistance and other factors.

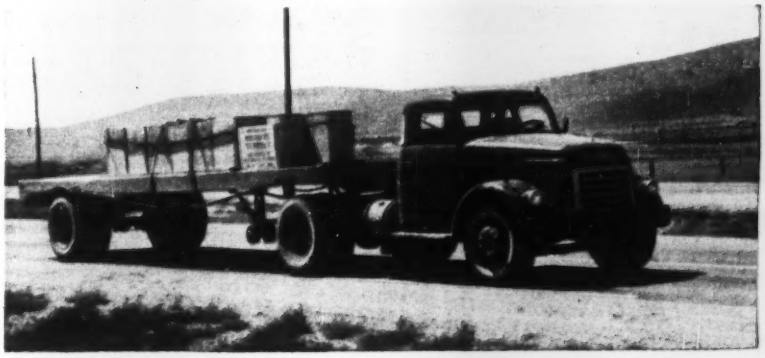
Pavement test nears winter shutdown

Over one hundred thousand applications of heavy axle loads had been made up to Nov. 1 on the test pavements built near Malad, Idaho, under the auspices of the Western Association of State Highway Officials (ENR July 3, 1952, p. 36). Plans now are being made to shut down the test-truck movements as soon as the subgrade freezes. By that time the total number of truck movements is expected to be up to 140,000. That frequency is about equal to that on only the most heavily traveled roads.

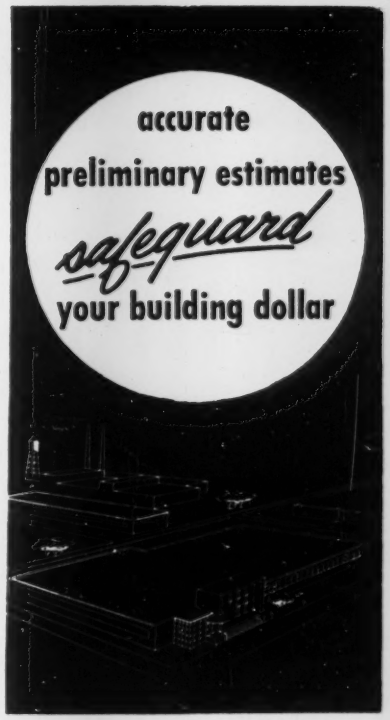
Except for some special tests and removal of snow from the pavements so that frost conditions will be similar to those on a normal highway during winter, all work on the project will be shut down until frost begins to leave the roadway in the spring. Then the regular test loads will be operated through the critical period while frost is coming out of the ground.

This will be a departure from what was done last spring. Then, because the pavements were new, no testing was done until the ground was free of frost. Test loads will be 18,000 and 22,400 lb on single axles and 32,000 and 40,000 lb on dual axles.

Testing is under the direction of the Highway Research Board, with Wm. N. Carey, Jr., in charge. The Bureau of Public Roads is cooperating in the test work.



TRUCK-TRAILER UNIT with the 22,400-lb load on the rear axle operating on the north loop of the WASHO test road.



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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—BUILDINGS

Me., Calais—HOSPITAL—B.A. 12/30—Calais Hospital, Church St., (selected list bidders) 2 story bsmt., hospital addn., Franklin St. $350,000. Plans deposit $50, refundable. Kendall Taylor & Co., Inc., 221 Columbus Ave., Boston, Mass., arcnts. CD 6/30.

Conn., Beacon Falls—SCHOOL—B.A. 1/5—Town, Bd. Educ., Beacon Falls, elementary school, Highland Ave. $350,000. Plans deposit $50. Walter Crabtree, Jr., 195 Fern St., West Hartford, arcnt. CD 9/21.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
S. & M. Constr. Co., Inc., 30 Salmon St., Providence, R. I. LB **$1,171,503**, est. $1,110,000. fy. and bridge, F328, Barnstable and Yarmouth;
Petricca Constr. Co., 534 West St., Pittsfield, Mass. LB **$134,345**, est. $150,000. fly. reconstr. Rte. No. 43, S. 91 (2), Hancock. Bids Dec. 8. CD 11/12 and 11/25.

BUILDINGS

LOW BIDS AND CONTRACTS

† **F. D. Rich Co.**, 322 Main St., Stamford, Conn. LB **$935,500**. Lot 1, reconnaissance technical laboratory, Westover Air Force Base, ENG-19-016-54-44, CHICOPEE FALLS, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Dec. 8. CD 11/11.

▲ **Joseph Rugo, Inc.**, 581 Boylston St., Boston, Mass. LB **$1,389,000**, est. $900,000. Silver Lake Regional High SCHOOL, KINGSTON, MASS. Towns of Kingston, Pembroke, Halifax, Plympton Regional School Comm., John Farmer, chn., West Elm St., Pembroke, Mass. Bids Dec. 10. CD 11/16.

John F. Corcoran, 130 Washington St., Hartford, Conn., CA, **$93,000**, BOILER HOUSE, Northwest School, 485 Woodland St., HARTFORD, CONN. City Bd. Educ., 249 High St., Hartford, Conn.

W. J. Megin, Inc., 51 Elm St., Naugatuck, Conn., LB, **$636,555**, HOSPITAL addn., alterations, Step 2, Watertown Ave., WATERBURY, CONN. Waterbury Hospital, Robbins St., Waterbury, Conn. Bids Dec. 8. CD 11/11.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

† **N. J., Bayonne**—FUEL OIL LINE EXTENSION—B.A. 12/29—Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York 7, N. Y., exten. fuel oil line, North Bulkhead Berths N-7 to N-6, U. S. Naval Supply Depot, Spec. 41630. Plans deposit $30.

† **Md., Cumberland**—BARRICADE—B.A. 1/5—Dist. P. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va., barricade at Allegany Ballistics Laboratory, Cumberland (Pinto, W. Va.), NOY 82857, Spec. 42797. Plans deposit $10.

Md., Rockville—B.A. 1/18—At office Montgomery County Purchasing Bureau, County Office Bldg., Contr. 426-A, 510 sq. yd. concrete sidewalks, 900 sq. ft. curb and gutter, 459 sq. yd. bit. paving, 539 lin. ft. sod, in Rosewood; Contr. 547-A, 384 lin. ft. concrete pipe drains Mansfield Rd. in Sligo Park Hills. Plans deposit $5 each.

† **Del., New Castle**—QUARTERS—B.A. On Or About 1/21—U. S. Eng., 121 N. Broad St., Phila. 1, Pa., rehabilitation 2 bachelor officers quarters at New Castle County Airport, approx. 6 mi. South of Wilmington, adjacent to U. S. Hy. Route 13, ENG-36-109-54-98.

Pa., Bon Air—B.A. 2/1—Haverford-Radnor-Marple Twps., Haverton, sewage disposal plant extens. $780,000, William Raisch, Station Plaza, Garden City, N. J., engr. CD 10/26/50.

SOON LETS CONTRACTS—BUILDINGS

N. J., Hightstown—FACTORY—Hightstown Rug Co., Hightstown, soon lets contract, 150x480 ft., masonry factory. $800,000. James C. Flaherty, 3 Eastern Ave., Dedham, Mass., archt.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **American Bridge Co.**, 71 Broadway, New York 6, N. Y. LB **$3,941,958**, constr. Rte. 119-G (Rockaway Route), Jamaica Bay Crossing, bridge and high trestle superstructures from North Channel to Beach Channel, Queens Boro, NEW YORK. New York City Transit Auth., 370 Jay t., Brooklyn 1, N. Y. Bids Dec. 11. CD 12/7.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
J. D. Eckman, Inc., Box 176, Atglen, Pa. CA **$1,779,889**. rein.-con., variable 22 ft. 33 ft. wide, 2 precast rein.-con. bridges over branch of Octoraro Creek and Knights Run, 2 rein.-con. bridges over Pine Creek and Octoraro Creek, one I-beam bridge over Penna. R.R., T.R. 41, in Atglen and Christiana Boros, Sadsburg, West Sadsburg and West Fallowfield Twps., Lancaster and Chester Counties. CD 11/24, under LB.

† **Tippett & Wood**, Phillipsburg, N. J. LB **$69,800**. Water Tank and Tower No. 67 at Veterans Admin. Hospital, COATESVILLE, PA. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Dec. 8. CD 10/30.

Buckley & Co., Inc., 1317 S. Juniper St., Phila., Pa. LB **$961,798**, sewer Mill Creek Relief Sewerage sys., PHILA, PA. Dpt. Procurement, City Hall Annex, Phila., Pa. Bids Dec. 3. CD 11/6.

▲ **MARYLAND**—State Rds. Comn., 108 E. Lexington St., Baltimore,
F. P. Asher Jr. Sons, Inc., 1715 West St., Annapolis, Md. LB **$1,082,325**, grading, drainage, surf. 2.636 mi. Baltimore National Pike, near Ridgeville, Contr. F 537-2-715, Frederick Co.;
Richard F. Kline, Water St., Frederick, Md. LB **$233,618**. Grading, drainage, wid'n., relocation surf. 1.04 mi. State Rte. 71, near Little Pipe Creek, Contr. CL 336-1-715, Carroll Co. Bids Dec. 8. CD 11/25.

BUILDINGS

LOW BIDS AND CONTRACTS

Ranes Constr. Corp., 151 Montague St., Brooklyn, N. Y. LB **$624,998**, est. $600,000. South Central Elementary SCHOOL, Woodward Parkway, Tomes and Spillman Aves., FARMINGDALE, N. Y. Bd. Educ., Union Free School Dist. No. 22, Weldon E. Hewitt, High School, Van Cott Ave., Farmingdale, N. Y. Bids Dec. 3. CD 11/25.

Otto Steinwachs & Son, 1661 N. Clinton Ave., Rochester, N. Y. CA **$550,000**. 4 story, 40,000 sq. ft. PLANT, ROCHESTER, N. Y. Wollensak Optical Co., 850 Hudson Ave., Rochester, N. Y. Waasdorf & Northrop, 311 Alexander St., Rochester, N. Y., archts. Herbert Kopf, c/o owner, engr. Bids Nov. 18, awarded Nov. 24. CD 11/13, under Revere Camera Co., as owner.

▲ **Joseph P. Blitz, Inc.**, 150 E. 39 St., New York 16, N. Y. CA **$1,500,000**. HIGH SCHOOL, Shepperd St., Princeton Rd. and Berkeley Ave., ROCKVILLE CENTER, N. Y. Bd. Educ., Rockville Center, N. Y. F. P. Widersum, 85 W. Hawthorne Ave., Valley Stream, N. Y., archt.

Nuova Bros., Inc., c/o Gustave W. Iser, archt., 95 Madison Ave., New York 16, N. Y. Owner Builds **$870,000**, two 6 story APARTMENTS, Midland Ave., YONKERS, N. Y. CD 11/19.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

Coronet Constr. Corp., c/o Albert F. Engle, Browning Rd., Merchantville, N. J., Separate Contracts, **$800,000**, RESIDENTIAL DEVELOPMENT, Berlin Estates, BERLIN, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archt.

▲ **Marlin Constr. Corp.**, Browning Rd., Merchantville, N. J., Separate Contracts, **$2,000,000**, RESIDENTIAL DEVELOPMENT, Delsea Estates, CLAYTON, N. J.

▲ **Browning Builders**, c/o Albert F. Engle, Browning Rd., Merchantville, N. J., Separate Contracts, **$2,200,000**, RESIDENTIAL DEVELOPMENT, Main St., ERLTON, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archts.

▲ **Cinderella Homes, Inc.**, Box 118, Haddonfield, N. J., Separate Contracts, **$1,400,000**, 140 RESIDENTIAL DEVELOPMENT, Evesham Rd., GLENDORA, N. J.

▲ **Kingston Estates, Goodwin Constr. Corp.**, Haddonfield, N. J., Separate Contracts, **$10,000,000**. 600 RESIDENTIAL DEVELOPMENT, Kings Highway, HADDONFIELD, N. J.

Elling Bros., Somerville, N. J., LB, **$101,366**, BOILER PLANT alterations, and outside steam services, Veterans Administration Hospital, LYONS, N. J. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Dec. 8. CD 10/27.

▲ **Bryerwood Corp.**, 141 Garrett Rd., Upper Darby, Pa. Separate Contracts. **$4,500,000**. RESIDENTIAL DEVELOPMENT, New Ardmore Ave., BROOMALL, PA.

† **Interboro Co.**, 235 E. 34 St., New York, N. Y. LB **$194,200**. impry. BOILER PLANT BLDG. No. 14, Veterans Admin. Hospital, COATESVILLE, PA. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Dec. 8. CD 11/23.

▲ **Lloyd F. Kershmer, Inc.**, Main and Astor Sts., Norristown, Pa. CA **$1,000,000**, battery PLANT, CONSHOHOCKEN, PA. C & D Batteries, Inc., Conshohocken, Pa. Edwyn Grant Rorke, Norristown, Pa., archt.

▲ **Heywood Hall Constr. Co.**, 315 Del Kalb St., Norristown, Pa. CA **$1,500,000**. APARTMENT, Johnson St., NORRISTOWN, PA. Pinewood Constr. Co., 315 Del Kalb St., Norristown, Pa. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

▲ **Morrow Bros. Inc.**, 2315 N. Charles St., Baltimore, Md. CA **$2,500,000**. 2 story, bsmt., steel, rein.-con. branch DEPARTMENT STORE and SHOPPING CENTER, 6300 Block York Rd., 10 acres, BALTIMORE, MD. Stewart & Co., Lexington and Howard Sts., Baltimore, Md. Bids Nov. 25. CD 11/18.

▲ **Kahn Engineering Co., Inc.**, 427 O St. S.W., Wash., D. C. CA **$1,123,044**. North Bethesda Junior High SCHOOL, Bethesda, ROCKVILLE, MD. Montgomery Co., Bd. Educ., Rockville, Md. CD 12/7, under LB.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

Va., Alexandria—B.A. On Or About 12/28—City, City Hall, approx. 340 lin. ft. 5x17 ft. rein.-con. addl. storm drainage culvert, etc. over Hoffs Run. CD 9/2/52.

BIDS ASKED—BUILDINGS

Fla., Tampa—SCHOOL—B.A. 2/2—Hillsborough Co. Bd. P. Instruction, Court House, high school, Plant City. Over $750,000. Plans deposit $100. Eliot Fletcher, 404 Marion St., Tampa, Fla., archt. CD 5/21.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

LOUISIANA—State Hy. Dpt., Highway Office Bldg., Baton Rouge,
Texas Bitulithic Co., Box 8044, New Orleans 22, La. LB **$60,418**, bit. hot mix surf. course 2.8 mi. Lee Micheaud Hy., State Rte. No. 2, S.P. 6-04-33, Orleans Parish,
Hall & Holland, Montgomery, La. LB **$115,707**, bit. surf. tr. (asph. cement) 5.402 mi. Mangham-Buckner Hy., State Rte. No. 64, S.P. 166-04-02, Richland Parish; LB **$74,264**, bit. surf. tr. (asph. cement) 5.224 mi. Wyatt-Midway Hy., State Rte. 547, Jackson Parish,
W. H. Patterson & Co., Box 2229, Baton Rouge, La. LB **$182,053**, bit. surf. tr. 3.596 mi. Rayne-Maxie Hy., State Rte. 365, S.P. 210-04-02, Acadia Parish,
Forcum-James Co., Box 911, Baton Rouge, La. LB **$94,485**, bit. surf. tr. (asph. cement) 2.711 mi. Maxie Link Hy., State Rte. 368, S.P. 210-03-04, Acadia Parish,
The White Constr. Co., Lafayette, La. LB **$171,390**, bit. surf. tr. 6.303 mi. Forked Island-Kaplan Hy., State Rte. No. 26, S.P. 207-02-08, Vermillion Parish,
LeBlanc Brothers, 702 Louisiana National Bank Bldg., Baton Rouge, La. LB **$67,546**, bit hot mix surf. course 6.4 mi. Amelia-Gibson, Houma-Raceland and Gibson-Shriver Hys., State Rtes. No. 2, 28 and 1336, S.P. 5-02-20, 5-05-22 and 244-01-12, Assumption and Terrebonne Parish. Bids Dec. 2. CD 11/25.

(Continued on page 52)

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(Continued from page 50)

BUILDINGS

LOW BIDS AND CONTRACTS

Mann-Mobley Constr. Co., Fitzgerald, Ga., LB, $765,808, WHITE HIGH SCHOOL and COLORED HIGH SCHOOL OCILLA, GA. Irwin Co. Bd. Educ., Ocilla, Ga. Bids Dec. 8. CD 10/16.

Gene H. Bowyer, 620 Maderia Ave., Coral Gables, Fla., Owner Builds, $750,000, 56 RESIDENCES, MIAMI, FLA.

▲ **G. E. Bass & Co.,** P. O. Box 1033, Jackson, Miss. LB Bid 1 $827,619. Bid 2 $1,534,033. WAREHOUSE BLDGS. 1 and 2 at Naval Battalion Center, NOY 807,716, GULFPORT, MISS. Dist. P. Wks. Office, U. S. Navy, Charleston, S. C. Bids Dec. 8. CD 11/24.

▲ **The Fluor Corp. Ltd.,** 2500 S. Atlantic Blvd. Los Angeles 22, Calif. CA Est. $7,500,000. design and construct PLANT producing allyl chloride and chlorhydrins, NORCO, LA. Shell Chemical Corp., 50 W. 50 St., New York 20, N. Y. CD 8/18.

MIDDLE WEST

BIDS ASKED—BUILDINGS

Ill., Chicago—MEDICAL CENTER—B.A. 1/15—Northwestern University, 619 Clark St., Evanston. Morton Medical Center addn. on Chicago Campus, 310 E. Superior St., Zone 11. $870,000. Holabird, Root & Burgee, 180 N. Wabash St., Chicago, Zone 1, archts. CD 11/13/52.

▲ **Wis., Oshkosh**—SCHOOL—B.A. 1/19—Bd. Educ., Oshkosh, 1 story, irregular, 300x400 ft., brick, steel Junior High School. $1,110,000. Sanstedt & Knoop, 22 Otter St., archts. Perkins & Will, 309 W. Jackson Blvd., Chicago, Ill., and T. H. Irion, L. H. Klinke, 199 N. Main St., Oshkosh, assoc. archts. CD 3/2.

SOON LETS CONTRACT—BUILDINGS

▲ **Wis., Town of Granville** (P.O. Milwaukee)—HOTEL—Owner, c/o F. H. Hinton, archt., 828 N. Broadway, Milwaukee, Zone 2, soon lets contract 2 story, part basmt., L-shaped, 454x354 ft., hotel. $1,000,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

New York Central System, R. J. Crane, ch. engr., 466 Lexington Ave., New York 17, N. Y. Own Forces. $300,000, installing crossing signals at 15 crossings in ANDERSON, IND.

Welsbach Corp., 1500 Walnut St., Phila., Pa., LB, $207,664, water filtration plant;

Vincent DiVito, 2020 Flournoy St., Chicago, Ill., LB, $185,865, water distribution sys., WHITING, IND. City, Whiting, Ind. Bids Oct. 19. CD 10/12.

▲ **Kenny Constr. Co.,** 3220 Oakton St., Skokie, Ill., and S. J. Groves & Sons, 1104 W. Reynolds St., Springfield, Ill., CA, $3,062,481, interceptor sewer north from treatment plant to northern part of city and north and east end of sanitary district, DECATUR, ILL. City Sanitary Dist., Decatur, Ill. Bids Nov. 2, awarded Dec. 7. CD 11/12, under LB.

WISCONSIN—State Hy. Comn., State Hy. Office Bldg., Madison,

Wausau Constr. Co., Wausau, Wis., LB, $106,215. Contract 1, Structure B-58-15, Tie Pella-Shawano (Wolf River Bridge) Road, CT HY "M" Proj. 0939 (1) Shawano Co. Bids Dec. 8. CD 11/19.

WISCONSIN—State Hy. Comn., State Hy. Office Bldg., Madison,

Farmer Bros., Tomah, Wis., LB, $104,058. Contract 1, c.conc. 0.14 mi. Madison and Beaver Sts., City of Beaver Dam, U.S. Hy. 151, U-4201 (3), Dodge Co. Bids Dec. 8. CD 11/19.

Santucci Constr. Co., 5024 Church St., Chicago, Ill., CA, $439,877 storm sewers in various streets KENOSHA, WIS. City, City Hall, Kenosha, Wis. Bids Dec. 3. (Correction—contractor's price) CD 12/10, under CA.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Albert M. Higley Co.,** 2036 E. 22 St., Cleveland 15, O., CA Approx. $1,600,000. 3 and 5 story brick, glass ELECTRICAL ENGINEERING BLDG., CLEVELAND, O. Case Institute of Technology. 10900 Euclid Ave., Cleveland 6, O. CD 6/6/50.

▲ **Inland Constr. Co.,** 134 N. La Salle St., Chicago 2, Ill., CA, $3,000,000, 30-unit SHOPPING CENTER, Indianapolis Blvd. at 165 St., HAMMOND, IND. Landau & Perlman, 110 S. Dearborn St., Chicago, Ill. Victor Gruen, 232 Grand River Ave., Detroit, Mich., archt. Sidney Finck, 134 N. La Salle St., Chicago, Zone 2, assoc. archt. Awarded Dec. 9.

R. D. Robbins Co., 109 E. Sycamore St., Kokomo, Ind., Owner Builds, $300,000, HOMES in Sycamore Village, KOKOMO, IND.

▲ **James C. Moreland,** 5717 N. Milwaukee Ave., Chicago, Ill., Own Forces, $1,300,000. 75 HOMES, area of Canfield and Foster Aves., CHICAGO, ILL. A. J. Del Bianco, 5501 Irving Park Rd., Chicago, Ill., archt.

L. Luety, Beloit, Wis., CA, $82,000, 1 story, 104x108 ft. concrete block FACTORY addn., BELOIT, WIS. Adams Corp. (Korn Kurl Div.), 1126 Harvey St., Beloit, Wis. B. H. Jillson & Assocs., 820 Broad St., archts.

† **Douglas-Cloud Co.,** 1017 Penobscot Bldg., Detroit, Mich. LB $131,450. modernization of HEATING PLANT addnl. water supply at Veterans Admin. Hospital, DEARBORN, MICH. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Dec. 8. CD 10/30.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **South Dakota**—B.A. 1/5—Bureau Reclamation, Dpt. Interior, Rapid City, clearing 430 acres Pactoal Reservoir site, Cheyenne Division, Missouri River Basin Proj., Spec. 600C-134. L. N. McClellan, Bldg. 1A, Denver Federal Center, Denver, Colo., ch. engr.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

Brogan Constr. Co., 321 Locust St., Des Moines, Ia. CA $73,515. Bridge No. 6832 over Trout Creek, 1.5 mi. east of Mazeppa, Wabasha Co. Bids Nov. 20. CD 11/4.

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

A. L. Alley & Son, Box 387, Faribault, Minn. CA $435,068. grading 9.4 mi. Faribault, Rice Co. Bids Nov. 20. CD 11/5.

Geo. Bennett Constr. Co., 3001 N. 7 St. Trafficway, Kansas City 15, Mo. LB $139,842. storm and sanitary sewers at Manchester Trafficway, KANSAS CITY, MO. City, Dpt. P. Wks., City Hall, Kansas City, Mo. Bids Dec. 4. CD 3/30.

† **A. V. Middleton,** Neligh, Neb. LB $82,199. guardhouse and air police headquarters bldg., Lincoln Air Force Base, Inv. 25-066-54-33, LINCOLN, NEB. U.S. Eng., 1709 Jackson St., Omaha, Neb. Bids Dec. 8. CD 11/12.

▲ **Charles F. Smith & Sons, Inc.,** 118 Spirea Dr., Dayton, O., LB $2,960,768, water transmission line from Ashland pumping station to 51st pumping station, LINCOLN, NEB. City, City Hall, Lincoln, Neb. Black & Veatch, 4706 Broadway, Kansas City, Mo., engrs. D. L. Erickson, city engr. Bids Dec. 10. CD 12/2.

Rhoades Constr. Co., Newton, Kan. CA $116,429. street paving, NEWTON, KAN. City, Newton, Kan.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,

Moore Bridge Co., Ada, Okla., CA, $75,646, est. $82,483, bridge over Washita River, State Hy. 99A, Johnston Co.;

Dahlgren & Brooks, Commerce Exchange Bldg., Oklahoma City 2, Okla., CA, $192,660, est. $198,927, underpass at Frisco Ry. and U.S. 62, Okmulgee Co.;

Duard Pyle, 3409 Classen Blvd., Oklahoma City 6, Okla., CA, $520,381, est. $586,826, bridge over South Canadian River, U.S. 81, Canadian Co.;

W. E. Logan & Sons, Barnes Bldg., Muskogee, Okla., CA, $84,668, est. $77,170, bridge over Illinois River on U.S. 59, Cherokee Co.;

Collins & Hunt, Hasting, Okla., CA, $189,940, est. $202,282, bridge over Beaver River on U.S. 64, Cimarron Co. Grand total $1,063,295. Bids Dec. 8, awarded Dec. 10. CD 12/1.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City,

Blackburn Constr. Co., 1916 N. Broadway, Oklahoma City 3, Okla., CA, $100,982, est. $124,991, 6.66 mi. Hy. 28, Okmulgee Co.;

Dahlgren & Brooks, Commerce Exchange Bldg., Oklahoma City 2, Okla., CA, $384,138, est. $412,339, 1.544 mi. U.S. 62, Okmulgee Co.;

W. E. Logan & Sons, Barnes Bldg., Muskogee, Okla., CA, $98,432, est. $74,724, 10.87 mi. Hy. 59, Cherokee Co.;

Lavman & Sons Co., Riverside Dr., Tulsa, Okla., CA, $214,855, est. $254,996, 3.92 mi. Muskogee Co.;

John Erts Constr. Co., 1517 N. Broadway, Oklahoma City 2, Okla., CA, $163,746, est. $212,004, 5.09 mi. Wetumka, Hughes Co.;

Annis Constr. Co., 1647 Exchange St., Oklahoma City, Okla., CA, $96,452, est. $109,625, 4.63 mi. Meeker, Lincoln Co.;

Park-Ward Co., Commerce Exchange Bldg., Oklahoma City 2, Okla., CA, $90,731, est. $110,419, 4.01 mi. Checotah, McIntosh Co. Grand total $1,149,447. Bids Dec. 8, awarded Dec. 10. CD 12/1.

Sinclair Pipe Line Co., Commerce Bldg. Addn., Houston, Tex. Owner Builds. $129,634, pipe lines relocation in San Jacinto Dam and Reservoir Proj. Area, Houston, TEXAS. CD 10/26.

Houston Lighting & Power Co., 1016 Walker St., Houston, Tex. Force Account, $200,000, some electric power line extensions; $325,000, constr. electric transformer unit, GALVESTON, TEX. CD 3/25, under Industrial Buildings.

Ector Co., Odessa, Tex., cancelled bids to have been opened Dec. 22, 120x244 ft., structural steel, corrugated metal exterior Fair Park Coliseum, ODESSA, TEX. $400,000. CD 11/25.

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver,

Platt Rogers, Pueblo, Colo., CA, $154,552, rebuilding portion of East 4 St. Viaduct on State Hy. 96, Pueblo, Colo. Proj. C-02-0098-10, Pueblo Co. Bids Dec. 3, awarded Dec. 4. Mark U. Watrous, state hy. engr.

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver,

San Ore Constr. Co., McPherson, Kan., CA, $89,274, est. $99,362, grading, stab., structures, road mix asph. processing 5.453 mi. S-0001 (16), Burlington and Cheyenne Wells, Kit Carson Co. Bids Dec. 3, awarded Dec. 4. CD 11/24.

† **List & Clark Constr. Co.,** Railway Exchange Bldg., Kansas City, Mo. CA $56,085, est. $75,850, channelization Rio Grande River in San Antonio and Escondida areas, Middle Rio Grande Proj. Spec. DC 4037, NEW MEXICO. Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. Bids Nov. 17, awarded Nov. 30. CD 11/9.

BUILDINGS

LOW BIDS AND CONTRACTS

E. Carlstrom Constr. Co., Mankato, Minn. CA $488,944. general contract. HIGH SCHOOL, BELLE PLAINS, MINN. Bd. Educ., W. J. Gatz, clk., Belle Plains, Minn. Bids Nov. 18. CD 10/20.

Wisconsin-Minnesota Contractor, Inc., Winona, Minn. LB $951,850. general contract Washington Grade SCHOOL addn., and Junior-Senior High SCHOOL addn., NORTHFIELD, MINN. Bd. Educ., K. W. Wegner, clk., Northfield, Minn. Bids Dec. 2. CD 11/10.

George S. Birch, 1750 Harold St., Houston, Tex. Owner Builds. $338,000, four 2 story, masonry DWELLINGS, pier and beam fdn., air-conditioning, HOUSTON, TEX. CD 10/23.

Bill Williams Constr. Co., 2204 Fannin St., Houston, Tex. Owner Builds. $378,000, 28 masonry DWELLINGS, concrete slab fdn., $315,000. 22 brick, stone DWELLINGS, concrete slab fdn., HOUSTON, TEX. CD 10/1.

Mayflower Investment Co., Carr P. Collins, pres., 912 Commerce St., Dallas, Tex. Owner Builds. $750,000 Unit 1, SHOPPING CENTER, IRVING, TEX. CD 11/4.

Southern Oaks, c/o P. Andrews, and H. Lawler & E. Russell, Tyler, Tex. Owner Builds. $310,000, 30 DWELLINGS, $300,000, 40 DWELLINGS, TYLER TEX. CD 11/17.

▲† **Farnsworth & Chambers Co., Inc.,** Box 74, Houston, Tex., LB $4,574,625, est. $3,500,000-$4,500,000. 4 story, rein.-con. 300,000 sq. ft. general LABORATORY and ADMIN. BLDG., Inv. No. 291-54-5, LOS ALAMOS, N. M. U. S. Atomic Energy Comm., Procurement Sec., Los Alamos, N. M. Bids Dec. 3. CD 10/28.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Wash., Richland**—FIRE PROTECTION FACILITIES—B. A. 1/7—Atomic Energy Comm., Richland, fire protection facilities in 27 existing buildings with total 265,000 sq. ft. floor space, at Hanford Works. CD 6/30/52, under Public Buildings.

† **Arizona-Nevada**—CIRCUIT BREAKERS—B.A. 1/26—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point of f.o.b cars at Maricopa, Ariz., power circuit breakers for Maricopa, Sub-station, Davis Dam Proj., Spec. DS-4091. L. N. McClellan, ch. engr.

BIDS ASKED—BUILDINGS

Wash., Wenatchee—SCHOOL—B.A. 1/5—Most Rev. J. P. Dougherty, Bishop of Yakima, c/o St. Joseph's Parish, Wenatchee, 39,000 sq. ft. frame parochial school for St. Joseph's Parish, $300,000. Plans deposit $50. J. W. Maloney, Central Bldg., Seattle, Zone 4, archt.

SOON LETS CONTRACT—BUILDINGS

▲ **Wash., Seattle**—PLANT—Kaiser Gypsum Co., c/o Permanent Cement Co., 5975 E. Marginal Way, soon lets contract, 155x600 ft., steel frame wallboard plant on piling and 7 other buildings for gypsum plant, $4,000,000. Kaiser Engineers, Kaiser Bldg., Oakland, Calif. engrs. CD 7/20.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

General Constr. Co., 3840 Iowa St., Seattle Wash., LB, $686,000 dredging 3,000,000 cu. yd. from Industrial Waterway, TACOMA, WASH. Port of Tacoma, Portacoma Rd., Tacoma, Wash. Bids Dec. 7, CD 11/25.

▲ **F. W. Case Co.,** 926 Lyons St., Newhall, Calif., LB, $3,075,960, tar enamel lining alternate, pump delivery pipe lines at 5 pumping plants, Colorado River Aqueduct, LOS ANGELES, CALIF. Metropolitan Water District of Southern California, 306 W. 3 St. Los Angeles, Calif. Bids Dec. 9. CD 11/19.

CANADA

BIDS ASKED—BUILDINGS

▲ **Ont., Toronto**—PRINTING PLANT—B.A. 12/29—Murray Printing Co. Ltd., 192 Spadina Ave., 1 story, 460x480 ft. printing plant west of Barrie Hy., south of Sheppard Ave. W. $5,000,000. A. G. Facey, 991 Bay St., archt. CD 11/16.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Emil Anderson Constr. Co.,** Hope, B. C., CA, $4,000,000, new hydro-electric plant, consisting of two low-level dams, 12,000 ft. concrete canal and erection of power station to house generating unit, near Lillooet, BRITISH COLUMBIA, British Columbia Electric, 425 Carroll St., Vancouver, B. C. Awarded Dec. 3. Thomas Ingledow, 425 Carroll St., Vancouver, B. C., engr. CD 6/19.

▲ **BRITISH COLUMBIA**—Province of B. C., Douglas Bldg., Victoria,

Emil Andeson Constr. Co., Hope, B. C. LB, $1,018,914, 6.24 mi. Burnside Road-Goldstream Section Trans-Canada Hy., Esquimalt Electoral District. Bids Dec. 4. CD 11/27.

BUILDINGS

LOW BIDS AND CONTRACTS

Smith Bros. & Wilson Ltd., 1267 Richards St. Vancouver, B. C., CA $997,000, 6 story sub-bsmt., rein.-con., brick NURSES' HOME, VANCOUVER, B. C.,

St. Paul's Hospital, 1081 Burrard St., Vancouver, B. C. Gardiner & Thornton, 1664 W. Broadway, Vancouver, B. C., archts. Awarded Dec. 4.

Brookfield Constr. Co. Ltd., 32 Inglis St., Halifax, N. S., CA, $800,000, industrial buildings, Seaward Defense Site, incl. BOILER HOUSE, BULK STORAGE and DIVING SCHOOL, HALIFAX, N. S. Defence Constr. Ltd., 1032 Gottingen St., Halifax, N. S. Bids Oct. 20. CD 9/30.

Huron Constr. Co. Ltd., Richmond St., Chatham, Ont., CA, $800,000, HOSPITAL addn., CHATHAM, ONT. Chatham Public General Hospital, Chatham, Ont. Bids Oct. 28. CD 11/30, under LB.

Tope Constr. Co., Ltd., 701 Main St., Hamilton, Ont., LB, approx. $350,000, SCHOOL, Hampton Heights, HAMILTON, ONT. Bd. Educ., Hamilton, Ont. Bids Dec. 2. CD 11/13.

▲ **Gerard Daneau**, 5950 Cote Des Neiges Rd., Montreal, Que., Owner Builds, $1,000,000. APARTMENTS, Carlton Place, Victoria and Lavoie Aves., MONTREAL, Que. C. Grenier, 170 Geneva Cres., Mount Royal, Que., archt.

Adrien Hebert, 305 Lafayette St., Quebec City, Que., CA, $100,000, 1 story, 80x190 ft., steel, block, brick WAREHOUSE addn., QUEBEC CITY, QUE. Cie d' Immeubles Entreprises Roland, 243 d' Aiguillon St., Quebec City, Que.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† **Alaska**—ROAD, STREET, etc.—B.A. 2/10—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., road, street, sidewalk, paving with c.conc. and bit. surf. Ladd Air Force Base, Eng-95-507-54-4. Plans deposit $50. Extended date. CD 11/18.

BIDS ASKED—BUILDINGS

† **Alaska, Fort Richardson**—WAREHOUSE—B.A. 1/14—U. S. Eng., Anchorage, 57x98 ft., masonry POL storage and packaging warehouse, ENG-95-507-54-15. Plans deposit $25. CD 11/25/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **J. A. Troxell**, Bellevue, Wash. LB $472,920. 7 ft. diam. unlined tunnel with trash racks, surge chamber, concrete tunnel plug, etc., first phase of $1,303,000 Purple Lake hydro proj., METLAKATLA, ALASKA. Metlakatla Indian Community City Hall, Metlakatla, Alaska. Bids Dec. 7. CD 11/25.

BUILDINGS

LOW BIDS AND CONTRACTS

† **Sam Macri & Sons, Inc.**, Anchorage, Alaska. LB $235,516. WAREHOUSE, Inv. 54-32, FORT RICHARDSON, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Dec. 2. CD 11/5.

PUERTO RICO

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Font & Montilla, Inc.**, P.O. Box 9611, Santurce, Puerto Rico, LB $873,974, bachelor officers quarters, Ramey Air Force Base, Inv. 54-25, AQUADILLA, PUERTO RICO. U.S. Eng., P.O. Box 4970, Jacksonville, Fla. Bids about Dec. 2. CD 10/15.

LATIN AMERICA

BIDS ASKED—HEAVY CONSTRUCTION

† **Bermuda**—POL FACILITY—B.A. 1/6—Office Dist. Engineer, Atlantic Dist., 346 Broadway, New York 13, N. Y., POL facility and misc. structures at Kindley Air Force Base, ENG-30-347-54-4.

Proposed Projects——

WATER SUPPLY

Ga., Cartersville—City, WW imprvs. $450,000. Wiedeman & Singleton, P.O. Box 1878, Atlanta, consult. engrs.

Okla., Ponca City—City, voted bonds Dec. 1, WW exten. $400,000. Pate Eng. Co., Tri-State Bldg., Tulsa, consult. engr. CD 11/12.

SEWERS, WASTE DISPOSAL

Calif., Brea—City, 401 S. Pomona Ave., voted $245,000 bonds, sewer imprvs. CD 10/23.

▲ **Calif., Los Angeles**—Los Angeles County Sanitation District 22, 2020 Beverly Blvd., $5,000,000 bond election Jan. 19, sewage collection facilities, 38 mi. trunk lines, San Dimas, Azusa, Covina, etc. A. M. Rawn, c/o owner, engr.

Calif., Palm City—Palm City Sanitation District, 1600 Pacific Hy., San Diego trunk sewers, collecting sewers and treatment plant, $810,000.

▲ **Mich., Hamtramck**—City, storm sewers, connecting conduits from Seven Mile Rd. to Detroit River, $1,000,000.

Mich., Saginaw—City, City Hall, 34 lateral sewers and 2 trunk sewers, $340,000, Carl T. Dust, city engr. CD 10/3.

Neb., Fairbury—City, sewage plant, $250,000.

▲ **N. J., Bayonne**—City, City Hall, 20 million gal. daily capacity, sewage treatment plant. $10,000,000. CD 9/27/45.

▲ **N. J., Hoboken**—City, City Hall, 24 million gal. daily capacity, sewage treatment plant, $3,149,320. renovation and replacement outmoded sewers. $8,000,000. CD 2/26/47.

N. J., Secaucus—City, City Hall, 1 million gal. daily capacity, $400,000.

Okla., Ponca City—City, voted bonds Dec. 1, sewage disposal imprvs. $350,000. Pate Eng. Co., Tri State Bldg., Tulsa, consult. engr. CD 11/12.

Tex., Abilene—City, City Hall, city sanitary sewer line from city limits to Abilene Air Force Base, $355,139. Freese & Nichols, 407 Danciger Bldg., Ft. Worth, consult. engrs.

Va., Waynesboro—City, City Hall, voted $900,000 bonds, sewage treatment plant and interceptor sewers. Myron Sturgeon Engineers, 2124 Kimball Terrace, Norfolk, consult. engrs. W. T. Wells, city engr. CD 6/30/52.

BRIDGES

Ill., Chicago—Cook Co., County Bldg., grade separation Torrence Ave. under B & O R.R. R/W $900,000.

▲ **Mo., St. Louis County**—St. Louis County, c/o Luman F. Matthews, co. superv., Court House, Clayton, Zone 5, vehicular toll bridge across Missouri River connecting St. Louis and St. Charles Counties, $10,000,000, Sverdrup & Parcel, Syndicate Trust Bldg., 917 Olive St., St. Louis, Zone 1, consult. engrs. CD 11/23.

▲ **Okla., Oklahoma City**—Oklahoma County, Court House, voted $1,083,000 bonds, 3 county bridges, Hudgins, Thompson & Bell, 1100 W. Main St., consult. engrs. CD 11/10.

▲ **Man., Winnipeg**—Municipality, City Hall, bridge over Assinboine River at Hargrave St. $2,000,000. J. B. Striowski, City Hall, city engr. associated with W. Walkden, 91 Ferndale Ave., engrs. CD 11/9.

STREETS AND ROADS

▲ **Ind., Indianapolis**—Bd. P. Wks., City Hall 8 major thoroughfares, incl. College Ave. between 25 and 28 Sts., and between 11 and 16 Sts.; Keystone Ave. from 38 to Millersville Rd., 34 from Southerland to Sherman, Harding from Washington to Kentucky; Orchard from 30 to 38 Sts.; Sherman from 16 to 21 and from 30 to 38 Sts., eliminate jog at Raymond and Shelby Sts.; widening sections E. 16 and E. 21 Sts., reconstructing and widening all of above. $2,000,000. CD 7/22/43.

▲ **Va., Norfolk**—City, City Hall, constr. Tidewater Drive approx. 1.3 mi. 6-lane street, $1,358,000, Hayes, Seay, Mattern & Mattern, 163 W. Olney Rd., consult. engrs. CD 3/5.

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W. Va., Glasgow—Town, bond election Dec. 23 sidewalks, curbs, gutters, retaining walls, road pavement and storm sewers on specified streets $225,000.

EARTHWORK, WATERWAYS

▲ **Okla., Oklahoma City—City, City Hall,** voted bonds **North Canadian River floodway imprvs. $1,812,000, W. W. Baker, city engr. CD 11/10.**

AIRPORTS

Tex., Alice—AIRPORT IMPRVS.—City, municipal airport imprvs. $500,000. Mitchell & Hunt, Transit Tower, San Antonio, consult. engrs.

LATIN AMERICA

▲ **Mexico, Guadalajara—Instituto Mexicano del Seguro,** Social, Mexico City, plans by Antonio Serrato, Mazarich 86, Mexico City, 200-bed public hospital with possible increase to 400. $1,500,000.

▲ **Mexico, Puebla**—Instituto Mexicano de Seguro Social, Mexico City, plans 400 bed hospital. $1,160,000.

PUBLIC BUILDINGS

▲ **Calif., Campbell**—SCHOOLS—**City, City Hall** voted $2,500,000 bonds, schools. CD 9/30.

Calif., Gilroy—SCHOOLS—City, City Hall, defeated $750,000 bonds, schools. CD 10/7.

Calif., Fresno — SCHOOLS — Scandinavian Elementary School District, Rt. 2, Box 54X, Fresno, voted $600,000 bonds, schools addns.

Calif., Lemon Grove—SCHOOLS—Lemon Grove School District, Lemon Grove, $550,000 bond election Feb. 16, schools.

▲ **Calif., Long Beach**—SCHOOL—Long Beach Bd. Educ., 715 Locust Ave., plans by Hugh Gibbs, 441 E. First St., three 2 story high school bldgs., and gymnasium, Spring and Palo Verde Sts, $4,000,000. CD 11/16/50.

▲ **Calif., San Bernardino**—SCHOOLS—San Bernardino City School District, defeated $2,750,000 bonds, 2 gymnasiums at Pacific and San Bernardino High Schools. CD 10/5.

▲ **Calif., San Francisco**—HOUSING—San Francisco Housing Auth., 440 Turk St., plans by Donald Beach-Kirby & Assocs., 109 Stevenson St. Middle Point Road Housing $3,500,000.

▲ **Fla., Orlando**—SCHOOLS—Orange Co. Bd. Educ., Orlando, plans by Richard Boone Rogers, 14 E. Church St., elementary school, Apopka, $320,210, CD 2/5/52; plans by Geo. H. Spohn, 501 Park Ave., Winter Park, Corrine Drive Elementary School, $406,700; plans by Robert B. Murphy, Church and Main Bldg., Orlando, Conway Elementary School, $320,210. CD 5/9/49.

Ill., Belleville—SCHOOL—School District 118, E. L. Allen, supt. Schools, voted $800,000 bonds Dec. 19, Jefferson School addns., Union School addn. CD 6/1/51.

▲ **Ill., Chicago**—SCHOOL—Bd. Educ., 228 N. La Salle St., Zone 1, Brown Elementary School, near Warren Blvd. and Damen St., $1,000,000. CD 3/30/45.

Ind., Dublin—SCHOOL—Robert J. Burgess, Trustee, Franklin Twp., Dublin, Whitewater School addn. $777,000.

▲ **Mass., Brockton**—SCHOOL—City, E. A. Nelson, supt. Schools, plans by Edmund J. Leeds & Assoc., Inc., 154 Brighton Ave., Allston, 2 story, brick, steel, concrete South Junior High School, $1,400,000. CD 3/2/53.

▲ **Mo., Webster Groves** (St. Louis 19 P.O.)—SCHOOL—Webster Groves School Dist., Bd. Educ., Leonard A. Steger, supt. Schools, 16 Selma Ave., plans by Childs & Smith, 20 N. Wacker Dr., Chicago, Ill. and Wm. B. Ittner, Inc., assoc. archt., 408 Bd. Educ. Bldg., 911 Locust St., St. Louis, Zone 1, Junior High School on Memorial Field, $1,655,000. CD 11/23.

▲ **N. M., Roswell**—HOSPITAL—Chavez Co., Roswell, plans by Vorhees, Standhardt & Swatek, Box 568, 1 story, masonry hospital, $1,000,000.

N. Y., Greenville (P.O. Scarsdale)—SCHOOL—Village, voted $1,750,000 bonds Dec. 8, Junior-Senior High School.

▲ **N. Y., Huntington**—HIGH SCHOOL—School Dist. 13, Huntington, $2,400,000 bond election Jan. 23, Junior-Senior High School, tract south of Jericho Turnpike in West Hills.

▲ **O., Garfield Heights**—SCHOOL—Garfield Heights Bd. Educ., O. H. Schaaf, supt., 4900 Turney Rd., elementary school and addn. to present high school, Turney and Granger Rds., $1,450,000. CD 11/12/51.

▲ **Okla., Oklahoma City**—SCHOOLS—Oklahoma Co., Court House, voted bonds, negro schools, $1,000,000, Hudgins, Thompson & Bell, 1100 W. Main St., archts. CD 11/10.

▲ **Ore., Salem**—HOSPITAL—State Bd. Control, Capitol, plans by Hollis Johnston, Concord Bldg., Portland, 5 story geriatrics hospital, $1,500,000.

Tex., Rockdale — HIGH SCHOOL — Rockdale Independent School Dist., Rockdale, voted bonds Dec. 5, supplemental high school $500,000. George L. Dahl, 2101 N. St. Paul St., Dallas, archt. CD 11/19.

† **Va., Fredericksburg**—GEOMAGNETIC LABORATORY—General Services Admin., General Services Bldg., F St. N.W., Wash., D. C., geomagnetic laboratory at Camp A. P. Hill, $750,000.

▲ **Wash., Kennewick**—SCHOOLS—School District No. 17 Lakeside Home Story School $600,000, another elementary school $600,000; Junior High School $1,000,000. CD 2/10.

▲ **Alaska, Anchorage**—SCHOOLS—School Bd., four schools, $2,000,000 each.

▲ **Ont., Hamilton**—HOUSING—Central Mortgage & Housing Auth., 136 Charles St., 2,000 unit housing, Hamilton, Mohawk Rd. and West Fifth St. $15,000,000. CD 1/8/52.

▲ **Ont., Windsor**—CIVIC AUDITORIUM—City, City Hall, plans by Johnson-McWhinnie, 1645 Ottawa St., civic auditorium at Detroit River Waterfront, $1,500,000.

COMMERCIAL BUILDINGS

Calif., Belmont—HOMES—Piombo Constr. Co., 1571 Turk St., San Francisco, subdivision of 72 homes on Hilltop Tract on Tyson-Alford Property. $800,000.

Calif., Glendora—DWELLINGS—Shirley & O'Brien Development Co., 9208 E. Las Tunas Dr., Temple City, plans by Wm. B. Wilke, 268 S. Rosemead Blvd., Pasadena, 80 frame, stucco dwellings, Brunaby Ave., Foothill Blvd. and Dalton Ave. $650,000.

▲ **Calif., Pinole**—HOMES—Andrews & McGain, Orinda, subdivision of 67 - 250 homes, Tennent Ave. and elsewhere in Pinole area. $1,000,000.

▲ **Conn., Greenwich**—OFFICE, etc.—Home Owners Mutual Enterprises, Inc., Greenwich, plans by O'Hara, Hedlander & Edson, 45 E. Putnam Ave., office or laboratory and shopping center, Post Rd. in Byram, $5,000,000. H. W. Corbett, 1270 Ave. of Americas, New York, N. Y., consult. archt.

Ill., Geneva—HOSPITAL—Community Hospital, 416 2 Ave., plans by Frazier & Raftery, 315 James St., hospital addn. $500,000.

▲ **Kan., Wichita**—OFFICE—Union Development Co., Union National Bank Bldg., plans by Overend & Boucher, Brown Bldg., 10 story office. $1,000,000.

Mich., Detroit—DORMITORY—University of Detroit, C. J. Steiner, S.J., pres., 4001 W. McNichols St., plans by Harley, Ellington & Day, Inc., 153 E. Elizabeth St., brick, steel dormitory on campus at Holden Hall, $980,000. CD 7/16.

▲ **Mo., Normandy** (St. Louis 21 P.O.)—HOSPITAL—St. Vincent's Hospital, 7301 St. Charles Rock Rd., Zone 21, plans by Maquolo & Quick, 4908 Delmar Blvd., St. Louis, Zone 8, 4 story, brick, concrete, steel hospital addn., modernization, reconditioning existing bldg. $2,400,000. CD 11/30.

▲ **N. J., Ellisburg**—SHOPPING CENTER, etc.—Eugene Mori & Assocs., Garden State Racing Assoc., P.O. Box 311, Camden, shopping center, incl. department store, addnl. stores, office bldg. and parking facilities, $15,000,000; hotel with swimming pool, $2,500,000. CD 5/6.

▲ **N. M., Roswell**—HOSPITAL, etc.—St. Mary's Hospital, Roswell, 200-bed masonry hospital, $1,500,000; conversion of main bldg. into nurses training school, $375,000.

N. Y., Kew Gardens—APARTMENT—Neil Holding Corp., c/o Phillip Birnbaum, archt., 12 E. 48 St., New York, Zone 17, 6 story apartment for 120-families, 84 Dr. and 84 Rd., east of Manton St. $820,000.

O., Columbus—HOTEL—Fort Hayes Hotel, 31 W. Spring St., altering hotel, erecting 3 story office and storage bldg. $500,000.

O., Cleveland—ENGINEERING CENTER—Cleveland Engineering Society, 2136 E. 19th St., Zone 15, plans by Garfield, Harris, Robinson & Schafer, 1740 E. 12 St., Zone 15, 2 story, approx. 36,000 sq. ft. masonry Cleveland Engineering Center, E. 19th St. and Carnegie Ave. Approx. $700,000.

▲ **O., Newark**—SHOPPING CENTER—Carl D. Blickman, Cleveland & Assoc., Newark, shopping center on 47 acre tract in Mt. Vernon Rd. north of here, $1,200,000.

Tex., Dallas—GYMNASIUM, etc.—East Dallas Christian Church, Peak and Junius Sts., masonry gymnasium-youth center-adult bldg.-chapel. $625,000.

▲ **Tex., Dallas**—APARTMENTS, etc.—F. G. Lippitt Sr. & Assocs., Kirby Bldg., Unit 1, 35 apartment units, $350,000; Unit 2, 28 masonry apartment units, $300,000; Unit 3, 40 masonry apartment units, $400,000; Unit 4, 48 masonry apartment units, $480,000; Unit 5, 38 masonry apartment units, $389,000; Unit 6, 30 frame, masonry apartment units, $300,000; Unit 7, 55, frame, apartment units, $550,000; Unit 8, 60 masonry frame apartment units, $600,000; Unit 9, 32 cedar shake type apartment units, $320,000; Unit 10, 44 cedar shake, masonry, frame apartment units, $440,000 for eastern Oak Cliff Sect. Dallas Co.

▲ **Tex., Dallas**—SHOPPING CENTERS—F. G. Lippitt, Sr. & Assocs., Kirby Bldg., shopping centers, Sect. 1, 100,000 sq. ft. masonry type, $1,000,000; Sect. 2, 65,000 sq. ft. masonry type, $600,000, in a sect. of Eastern Oak Cliff.

▲ **Tex., Houston**—SHOPPING CENTERS—Dan Moody & Assocs., Abstract & Title Bldg., shopping center projects, Unit 1, $650,000; Unit 2, $750,000; Unit 3, $875,000, to serve Home Owned Estates and surrounding areas.

▲ **Tex., Houston**—APARTMENT UNITS—O. R. Winter, Developer, 2480 Times St., plans by Joseph B. Reynolds, 2480 Times St., Sect. 1, 50 frame, masonry apartment units, $500,000; Sect. 2, 75 masonry, frame apartment units, $750,000; Sect. 3, 35 brick veneer apartment units, $350,000; Sect. 4, 40 brick, stone type apartment units, $400,000.

Tex., Wichita Falls—CHURCH—Grace Methodist Church Congregation, Wichita Falls, 5-unit masonry church, facilities proj. $750,000.

▲ **B. C., Vancouver**—HOTEL—Hotel Georgia, 801 W. Georgia St., plans by Sharp & Thompson Berwick, Pratt, 1553 Robson St., 12 story, 200-room hotel addn., underground parking facilities. $2,000,000.

▲ **Man., Winnipeg**—APARTMENT—Owner, c/o Green, Blankenstein, Russell & Assocs., archts., 722 Osborne St. W., 335-suite, 10 apartment bldgs., McPhillips, in N.W. section of here. $3,000,000.

Ont., Toronto—OFFICE—Louis Mayzell, 410 Adelaide St. W., plans by Sidney Bregman, 7 Adelaide St. E., 10 story, bsmnt., 90x100 ft., concrete, steel frame OFFICE bldg., University Ave. and Adelaide St. W. $750,000.

▲ **Ont., Toronto**—RESIDENTIAL and INDUSTRIAL COMMUNITY—Victoria Park Development LTD., c/o A. W. Ruby, 10 Highland Ave., satellite residential and industrial community, northeast of here, adjoining Don Mills development, on 570-acre site, incl. 1,500 houses, 2,000 apartments, 4 schools, 2 shopping centers, 117-acre industrial strip, sewage disposal plant, community hall, etc. $30,000,000. Dr. E. G. Faludi, 614 Church St., consult. engr.

Ont., Toronto—APARTMENT—Owner, c/o Peter Caspari, 102 Eglinton Ave. E., 6 story 59-suite, sub-bsmnt. garage space, concrete, brick apartment, Eglinton Ave. W. at Chaplin Cres. Approx. $500,000.

Que., Montreal—SYNAGOGUE, etc.—Congregation Chevra Kadisha, A. Gordon, chn., 5213 Hutchinson St., plans by Greenspoon, Freedlander & Dunne, 4151 Sherbrooke St. W., synagogue, school, $500,000.

INDUSTRIAL BUILDINGS

▲ **Ariz., Tucson**—EXPLOSIVES HANDLING FACILITY—Hughes Aircraft Co., Tucson, explosives handling facility on 1,300-acre tract $2,400,000.

▲ **Calif., Oakland**—PLANT and ADMINISTRATION—Marchant Calculators, c/o Albert F. Roller, archt., 1 Montgomery St., San Francisco, manufacturing plant and new administration bldg. $4,000,000.

▲ **Kansas** — POWER PLANT AND SUB-STATIONS — Wheatland Electric Co-operative, Scott City, double power capacity of Jess Taylor Power Plant and substations at Tribune, Leoti, Syracuse, $2,300,000. Frank Horton & Co., Lamar, Mo., consult. engrs.

▲ **La., Krotz Springs**—PLANT—Gulf Refining Co., Humble Oil & Refining Co., The Texas Co., Texas Bldg., Houston Tex., recycling plant. $8,000,000.

▲ **Mich., Holland**—PLANT—General Electric Co., 2511 Book Bldg., Detroit, plans by Commonwealth Associates, Inc., Jackson, plant to mfg. hermetic motors. Over $1,000,000.

Mo., Lamar—GRAIN ELEVATOR—Missouri Farmers Assn., Columbia, grain elevator. $250,000.

▲ **Tex., Chillicothe**—PLANT, etc.—Chillicothe Chemical Mfg. Co., c/o Henry Brandon, 5311 Columbia St., Dallas, anhydrous ammonia fertilizer mfg. plant, $15,000,000; warehousing or storage, $400,000; machine and equip. repair shop, $250,000, 100-acre tract, 1 mi. south of here.

▲ **Tex., Dallas**—PLANT, etc.—Dearborn Stove Co., 1700 W. Commerce St., stove mfg. plant, $1,750,000; temporary stove mfg. quarters, $250,000; warehousing, $100,000.

▲ **Alta., Acheson**—PLANT—Canadian Palmer Stendel Oil Corp., Calgary, gas processing plant, $1,000,000.

▲ **Man., St. Boniface**—SERVICE STATION—Dominion Motors Ltd., Fort and Graham Sts., Winnipeg, service station near Norwood Bridge on Trans-Canada Hy., near here, $1,000,000.

▲ **Que., Black Lake**—MINE—United Asbestos Corp. Ltd., 132 St. James St. W., Montreal, preliminary work on Asbestos Mine, incl. drainage of Black Lake, 3,000 tons per day mill, dams, diversion channels, bridges and relocation of roads. $8,000,000. Total est. $15,000,000.

UNCLASSIFIED

Conn., Windsor—DRIVE-IN THEATER—Bernard E. Francis, atty., South Windsor, drive-in theatre, incl. concessions and Kiddie Land, former Higgins Property off Rt. 5 with exit and entrance on Chapel St. $300,000.

North Dakota—RURAL DISTRIBUTION LINES—Capital Electric Co-operative, Bismarck, 91 mi. rural distr. lines, headquarters, facilities, sys. imprvs., Burleigh Co. $350,000.

O., Cleveland—PARKING LOT—City, City Hall, Zone 14, 1,000-car downtown parking lot between Webster Court and Scovill Ave. and E. 9th and E. 14 Sts. $500,000. John C. Wenrick, city engr.

Tex., Del Rio—TRAILER PROJECT—Housing & Home Finance Agency, 300 W. Vickery St., Fort Worth, plans by G. Van Maltsberger, 2013 Belknap St., San Antonio, 200 unit trailer proj., incl. site development, water, sewer, lighting, natural gas sys., four laundries, appurtenant bldgs., roads and streets on Army Reservation, Laughlin Air Force Base. $300,000. Carter & Burgess, 815½ Throckmorton St., Fort Worth, consult. engrs.

Tex., Fort Worth—SOUND SUPPRESSOR—Consolidated-Vultee Aircraft Corp., Grants Lane, sound suppressor for jet engine test stand, rein.-con. with acoustical treatment inside, incl. water spray. $325,000. F. C. Hayton, c/o owner, plant engr.

▲ **Tex., Houston** — STADIUM — Houston Independent School Dist., 1600 Washington St., 12,000 seating capacity stadium, 50-acre tract off N. Shepherd St. $1,250,000. CD 10/11/49.

▲ **Ont., Sarnia**—RAILWAY YARD EXPANSION—Canadian National Railways, K. Huffman, ch. engr. Union Station, Toronto, railway yard expansion, incl. moving yards to east side of Plank Blvd. and expansion of marshaling yard to include 25 more tanks, $4,000,000.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS
December 29 Massachusetts

BIDS ASKED—BUILDINGS

▲ **Conn., Groton**—SCHOOL—B.A. 1/6—Town, c/o S. B. Butler, supt. Schools, five 1 story high school buildings, Frank Merritt Property, Fort Hill. $1,080,000. CD 3/10.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **E. Turgeon Constr. Co., Inc.**, 42 Weybosset St., Providence, R. I., LB **$1,049,477**, remodel and addn. Rhode Island Veterans HOME, Metacom Ave., BRISTOL, R. I. State of R. I. and Providence Plantations, F. A. Adams, Purch. Agent, State House, Providence, R. I. Bids Dec. 9. CD 12/2.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
January 14 New Jersey
STREETS AND ROADS
December 29 Maryland

▲† **Del., Dover**—AVAGAS, etc.—Bids Asked—U. S. Eng., 121 N. Broad St., Phila., Pa., avagas and lube oil facilities Dover Air Force Base, ENG-56-109-54-34, $1,460,424. Extended date. Jaros Baum Bolles, Penna. R.R. Bldg., Wilmington, Del., engr. CD 11/30.

BIDS ASKED—BUILDINGS

▲ **N. Y., Hamburg**—HIGH SCHOOL—B.A. 12/23—Bd. Educ., Union Free School Dist. 1, High School Bldg., Hamburg; Senior High School. $2,500,000.

SOON LETS CONTRACT—BUILDINGS

▲ **N. J., Newark**—HOSPITAL—Clara Mass Memorial Hospital, 16 Twelfth Ave., soon lets contract, 312-bed hospital. $3,700,000. CD 11/19.

▲ **N. J., Pennsauken**—PLANT, etc.—U. S. Steel Products Division, U. S. Steel Corp., 30 Rockefeller Plaza, New York, N. Y., soon lets contract steel container plant and offices, $1,000,000. W. H. Rudolph, c/o owner, in charge of engineering. CD 12/2.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MARYLAND**—State Rds. Comn., 108 E. Lexington St., Baltimore,

Williams Constr. Co., Box 145, Baltimore, Md. CA **$1,483,166**. grading, drainage, surf. 2.534 mi. Baltimore-Harrisburg Expressway, near Timonium, Contr. B 635-3-415, Baltimore Co. Bids Nov. 3, awarded Dec. 11. CD 11/6, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Valmont Homes**, c/o S. S. Calafati, archt., 4th St., East Northport, N. Y. Owner Builds. **$2,000,000**. 150 HOUSES on 37-acre tract bounded by Larkfield and Claypits Rds., EAST NORTHPORT, N. Y.

▲ **White Birches Homes**, c/o Joseph Kaprow, archt., 277 North Ave., New Rochelle, N. Y. Owner Builds. **$2,000,000**. 150 HOUSES, 51-acre tract bounded by Stratford and Wilmot Rds.: and Weaver St., NEW ROCHELLE, N. Y.

▲ **Turner Constr. Co.**, 1500 Walnut St., Phila., Pa., CA, $5,000,000, five PLANT buildings in Delaware Twp., Ellisburg, incl. shop and warehouse and paving, CAMDEN, N. J. R.C.A. Victor Div., Radio Corp. of America, Front and Cooper St., Camden, N. J. Bids Nov. 10. CD 11/5.

▲ **Fairway Knolls Homes**, c/o Nathan J. Gurtman, archt., 140 Market St., Paterson, N. J., Owner Builds, **$1,250,000**, 79 HOUSES on tract on Saddle River Rd. and Fair Lawn Ave., FAIR LAWN, N. J.

▲ **Harrington Park Homes**, c/o C. J. Kordys, archt., 116 Passaic St., Passaic, N. J. Owner Builds. **$2,600,000**. 102 HOUSES on tract on Lafayette Rd., HARRINGTON PARK, N. J.

▲ **Runnemeade Estates**, c/o Albert Engle, Route 38 Airport Circle, Pennsauken, N. J., Separate Contracts **$2,000,000**, 200 RESIDENTIAL DEVELOPMENT, RUNNEMEDE, N. J. C. Jones Burhler, 1422 Chestnut St., Phila., Pa., archt.

▲ **George A. Fuller Co.**, 511 Wood St., Pittsburgh, Pa. CA $1,000,000. household appliance BUILDING addn., railroad siding and paving, ALLENTOWN, PA. General Electric Realty Corp., 202 State St., Schenectady, N. Y. H. F. Everett & Assoc., 512 Hamilton St., Allentown, Pa., archts.

▲ **John N. Arovitch**, Aronimink Arms Apartment, Drexel Hill, Pa., Separate Contracts. **$1,250,000**. RESIDENTIAL DEVELOPMENT, Mary's Ford Rd., BALA-CYNWYD, Pa.

Anthony Volpe, R. D. 1, Bridgeport, Pa. Separate Contracts. **$750,000**. RESIDENTIAL DEVELOPMENT, Tyler Rd., etc. BRIDGEPORT, PA.

Clement Martin, Inc., 6230 Penn Ave., Pittsburgh, Pa. LB **$879,890**. 61x289 ft., 200x244 ft., 89x129 ft., 110x169 ft. and 60x114 ft., brick, block Monroeville Junior HIGH SCHOOL, Wm. Penn. Hy. and Haymaker Rd., MONROEVILLE, PA. Municipal Auth. of School Dist. of Monroeville, P.O. Turtle Creek, Monroeville, Pa. Bids Nov. 30. CD 11/17.

▲ **George A. Fuller Co.**, 597 Madison Ave., New York 22, N. Y. CA **$1,000,000**. Department STORE, PHILA., PA. W. T. Grant Co., 130 W. 42 St., New York, N. Y. Bids Dec. 1. CD 12/1.

J. C. Breyvogle, 74 E. Gay St., Columbus, O., CA

▲ **Joseph Nebel Co.**, 2140 F St. N.W., Wash., D. C., CA, **$1,369,000**, OFFICE, WASH., D. C. National Education Assn., 1201 16 St. N.W., Wash., D. C. Bids Nov. 24, awarded 12/14. CD 11/27, under LB.

SOUTH

BIDS ASKED—BUILDINGS

▲ **Fla., West Palm Beach**—SCHOOL—B.A. 1/5—Palm Beach Co. Bd. P. Instruction, West Palm Beach, South Olive Ave. School and 7 Avenue School, $1,000,000.

▲ **N. C., Winston-Salem**—HOUSING—B.A. 1/14—Winston-Salem Housing Auth., Reynolds Bldg., Housing Proj. NC 12-6, Cleveland Ave. Homes, 53 bldgs., 244-units. Plans deposit $50. Lashmit, James, Brown & Pollock, Reynolds Bldg., engrs.-archts. CD 9/1.

▲ **Va., Norfolk**—ADMINISTRATION and CLASSROOM—B.A. 1/14—Virginia State College, Petersburg, 1,980,000 cu. ft. admin. and classroom bldg. $2,000,000. Plans deposit $60. J. Binford Walford-0. Pendleton Wright, 103 E. Cary St., Richmond, archts. CD 11/25/52.

▲ **S. C., Gaffney**—HOSPITAL—B.A. 2/3—Cherokee Co. Comn., Gaffney, hospital, $1,109,000. CD 9/30/52.

N. C., Greenville—DORMITORY—B.A. 1/15—East Carolina College, Greenville, dormitory. $830,000. CD 7/23/51.

BUILDINGS

LOW BIDS AND CONTRACTS

Goode Constr. Corp., Builders Bldg., Charlotte, N. C. LB **$750,000**. Retail department STORE, SPARTANBURG, S. C. Sears, Roebuck & Co., 675 Ponce DeLeon Ave., Atlanta, Ga. Bids Dec. 8. CD 11/25.

Edward M. Fleming Constr. Co., 4121 N.W. 25 St., Miami, Fla., CA, **$929,000** DEPARTMENT STORE, CORAL GABLES, FLA. Sears, Roebuck & Co., 675 Ponce de Leon Ave., Atlanta, Ga. Bids Nov. 18. CD 12/11, under LB.

R. P. Farnsworth & Co., 1515 S. Salcedo St., New Orleans La. CA Est. **$850,000**. 100 RESIDENCES, LULING, LA. River Development Co., Luling, La.

G. Schroeder, 19 Rail St., New Orleans, La. Owner Builds. **$850,000**. WAREHOUSE, NEW ORLEANS, LA.

Sam P. Maury Constr. Co., 554 Adams Ave., Memphis, Tenn. CA **$878,087**, ADMINISTRATION-POSTGRADUATE BLDG., at Memphis Branch, University of Tenn., MEMPHIS, TENN. University of Tenn., Knoxville, Tenn. Bids Nov. 24. CD 11/11.

Bass, O'Brien & Padgett, 283 Scott St., Memphis, Tenn. CA **$731,033**, MEDICAL-SURGICAL BLDG., Memphis Branch, University of Tenn., MEMPHIS, TENN. University of Tenn., Knoxville, Tenn. Bids Nov. 10. CD 12/1, under LB.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
January 5 Missouri
STREETS AND ROADS
January 5 Missouri

▲† **N. M., Roswell**—PAVING—B.A. 1/6—U. S. Eng., Box 1538, Albuquerque, addnl. 20 in. rein.-con. paving, 50,000-60,000 sq. yd. Walker Air Force Base, Serial No. Eng-29-005-54-50. $750,000-$1,385,000. Extended date. CD 12/8.

▲† **Montana**—B.A. 2/2—Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo., Missouri Diversion Dam, Missouri Diversion Unit, Missouri-Souris Division, Missouri River Basin Proj. CD 5/25/44.

▲ **Texas and New Mexico**—OIL LINE—Bids Asked—Magnolia Pipe Line Co., Magnolia Bldg., Dallas, 56 mi. 8 in. crude oil line, from near Seminole, Tex. to Gladiola Junction, Lea Co., N. M. $2,600,000. CD 12/8.

BIDS ASKED—BUILDINGS

▲ **Tex., Lubbock**—HIGH SCHOOL—B.A. 1/26—Lubbock Independent School Dist., Lubbock, Junior-Senior High School. $2,377,050. Extended date. Atcheson & Atkinson, Sanford Bldg., archts. Zumwalt & Vinther, 1807 Mercury Bank Bldg., Dallas, engrs. CD 11/25

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Peter Kiewit Sons Co.**, 1024 Omaha Natl. Bank Bldg., Omaha, Neb. and **Morrison-Knudsen Co., Inc.**, 319 Broadway, Boise, Idaho, CA **$11,592,904**, Stage V, Garrison Dam embankment, Riverdale, Serial No. CIVENG-32-015-54-16, NORTH DAKOTA. U. S. Eng., Fort Lincoln, Box 300, Bismarck, N. D. Bids Oct. 15. CD 10/21, under LB.

▲† **Edward E. Morgan Co., Inc.**, Fondren Station, Jackson, Miss., and **Jones & Gillis, Inc.**, Clarksdale, Miss. CA **$6,148,684**. Major constr. work on Webster Dam and Reservoir on South Fork of Solomon River, KANSAS. Bureau Reclamation, Dpt. Interior, Stockton, Kan. CD 11/24, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **John Epple Constr. Co.**, 401 S. 6 St., Columbia, Mo. CA **$3,966,000**. general contract;

Wallace Plumbing Co., 2224 Summer St., Dallas, Tex. CA **$2,208,000**. plumbing, heating, ventilating and air-conditioning;

S. G. Sachs Co., 5540 West Park Ave., St. Louis 10, Mo. CA **$689,800**. electrical work;

Haughton Elevator Co., 121 S. 11 St., St. Louis 2, Mo. CA **$368,271**. elevators for 8 story, brick, steel, rein.-con. TEACHING HOSPITAL, MEDICAL and SURGICAL SCHOOL, COLUMBIA, MO. Curators of University of Missouri, Leslie Cowan, secy., Jesse Hall, Columbia, Mo. Grand total $7,232,071. Bids Dec. 9, awarded Dec. 11. CD 11/13.

▲ † **Brezina Constr. Co., Inc.**, Rapid City, S. D., CA **$1,288,279**. SCHOOLS, OFFICE and MISC. BLDGS. at Fort Berthold Indian Reservation, Inv. 32-015-54-13, NORTH DAKOTA. U. S. Eng., Fort Lincoln, Box 300, Bismarck, N. D. Bids Aug. 26. CD 9/3, under LB.

American Constr. Co., 2128 Welch St., Houston, Tex. LB **$94,115**, est. $100,000. 2 story, 41x42 ft. brick PLANT, concrete fdn. frame, HOUSTON, TEX. Bethlehem Steel Co., 7100 Clinton Dr., Houston, Tex. Bids Nov. 14. CD 11/12.

State Bd. Examiners, Helena, Mont. rejected bids Dec. 8, state laboratory, HELENA, MONT. Est. **$900,000**. CD 11/9.

FAR WEST

BIDS ASKED—BUILDINGS

Calif., Norwalk—SCHOOL—B.A. 1/5—Excelsior Union High School District, 15711 S. Pioneer Blvd., 40,785 sq. ft. Artesia High School addn. $750,000. Kistner, Wright & Wright, 816 W. 5 St., Los Angeles, archts. CD 2/21/50.

▲ **Calif., Alhambra**—SCHOOL—B.A. 1/11 — Alhambra City School District, 1601 N. Garfield Ave., 1 and 2 story, rein.-con., high school on Crow City ranch property, $2,750,000. Plans deposit $100. Marsh, Smith & Powell, 208 S. 8 St., Los Angeles, archts. CD 9/12/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Morrison-Knudsen Co., Inc.**, 319 Broadway, Boise, Idaho, CA **$777,105**, est. $838,514, relocating 2.9 mi. N.P. track, 0.2 mi. Hy. 30 and 0.2 mi. County Rd., The Dalles Dam Site, Wasco Co., Serial No. CIVENG-35-026-54-56, OREGON. U. S. Eng., 638 Pittock Block, Portland 5, Ore. Bids Dec. 8. CD 11/10.

▲ † **Fred H. Slate**, 7805 S.W. 40th St. and **E. C. Hall Co.**, 12012 S.W. Barbur St., Portland, Ore., CA **$2,591,261** grade, drain 8.7 mi. double track U.P. R.R. 7.1 mi. U. S. Hy. 30, The Dalles Dam site, Wasco Co., CIVENG-35-026-54-45, OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids Nov. 25, awarded Dec. 1. CD 12/1, under LB.

▲† **Gaasland Constr. Co., Inc.**, 1155 Ellis St., Bellingham, Wash., CA, **$1,724,845**, est. $1,946,000. "purex" facility at Hanford Works, with waste disposal facilities, incl. underground tanks and pipe lines, Inv. AT (45-1)-821, RICHLAND, WASH. Atomic Energy Comn., Richland, Wash. Bids Dec. 2. CD 12/10, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Herbert Goldsworthy, 409 Santa Monica Blvd., Santa Monica, Calif., LB, **$755,000**, second increment of new Junior COLLEGE, VENTURA, CALIF. Ventura Union High School & College District, Ventura, Calif. Bids Dec. 8. CD 11/17.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Brown & Root, Inc.**, 4100 Clinton Dr., Houston, Tex., U. S. A. CA, **$6,000,000**, wet gas process PLANT, Wizard Lake, Mulhurst, EDMONTON, ALTA. Texaco Exploration Co., Northern Hardware Bldg., Edmonton, Alta. CD 1/5.

▲ **Lawrence Constr. Co. Ltd.**, 765 Mount Pleasant Rd., Toronto, Ont., and **A. Holmes & Son**, Annadale Dr., Toronto, Ont., Owner Builds, **$2,500,000**, APARTMENT project near Avondale Ave. and Yonge St., TORONTO, ONT. Dr. E. O. Faludi, 34 Bloor St. E., Toronto, Ont., engr.

LATIN AMERICA

BIDS ASKED—BUILDINGS

▲ **Mexico, San Felipe**—PLANT, etc.—Bids Asked—Texas International Sulphur Co., 6300 Navigation Blvd., Houston, Tex., U. S. A., crude sulphur extraction plant, $1,500,000 products warehousing, $200,000. J. Harry Pollard, 2237 N. MacGregor St., Houston, Tex., engr. CD 11/12.

(Proposal Advertisements see pp. 61 to 63)

IF IT'S A

WET JOB

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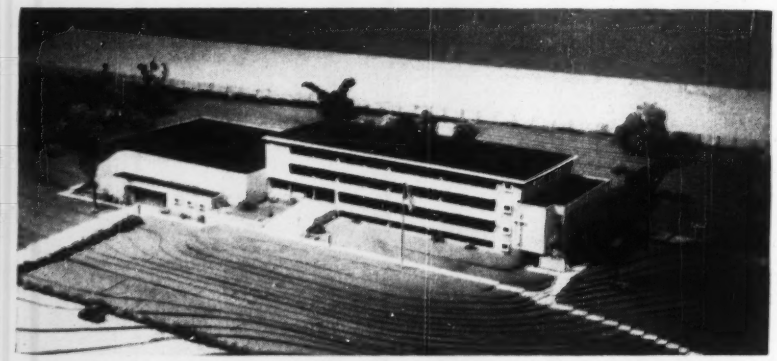

COVINGTON SCHOOL utilizes concrete flat plate construction and round sonotube columns.

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For two schools being built by the Catholic Diocese of Covington, Ky., the average cost was only $11.77 per sq ft and $0.81 per cu ft. A further breakdown shows costs averaging $10.00 per sq ft for the school building; $30.00 per sq ft for the chapel and $15.00 per sq ft for the gymnasium.

H. W. Miller Construction Co. was low bidder on a school in Covington at $631,063 and the John Hemmer Construction Co. bid a low $624,541 on a school at Newport. Betz & Bankemper, Covington, Ky., are the architects.

A preliminary study showed that the cost of the formwork comprised a large percentage of the total cost of the concrete superstructure. Consequently, by using concrete flat-plate with columns cast in round, paper forms, construction costs were kept down.

The concrete slabs are 8 in. thick and have no drop panels. Columns have no capitals; heads and reinforcing rods will resist the punching shear.

Columns in the interior rows are 16 in. in diameter; those in exterior rows are 12-in. Whereas the interior columns are designed to take bending, the exterior columns are not.

The roof has 2-in. thick insulation, builtup tar-and -gravel roofing, and a precast concrete curb around the perimeter. Insulation and smooth roofing will be applied to the top surface of the slab cantilevers in order to minimize expansion and contraction.

Exterior walls consist of 12-in. Norman brick laid in Flemish bond. Cost per sq ft for these is practically the same as if 8-in. standard brick were used, since the larger Norman brick can be laid more rapidly.

Each building will contain 15 full-sized classrooms, 23 x 32 ft; a gymnasium with a 50 x 84-ft contest court and a seating capacity of 2,000; a library accommodating 90 students; two science laboratories; a large chapel seating 200 and a small auditorium seating 175; a 300-seat dining room and various other administrative and utility rooms.

Wage rates in this area include: bricklayers, $3.225 per hr; plasterers, $3.15 per hr; electrical workers, $3.03 per hr; carpenters, $2.875 per hr; and common laborers, $2.02 per hr.

The breakdown of costs on the Covington school includes:

1C H. W. Miller Const. Co.		$831,063
Item	Cost	% of total cost
General Construction		
Initial expense	$6,250	1.0%
Sculpture Work	3,200	0.5
Site excavation	12,250	1.9
Building excavation	5,500	0.9
Seeding and sodding	6,200	1.0
Bituminous paving	23,000	3.6
Conc footings & fndn wall	23,500	3.7
Conc slabs on ground	13,000	2.1
Struct conc slab, beams, & columns	58,000	9.2
Misc conc stairs, bleachers, etc.	15,000	2.4
Exterior walk, steps, etc	2,856	0.5
Reinforcing steel	38,100	6.1
Membrane waterproofing	1,200	0.2
Msnry and cut stone	81,000	13.3
Struct & misc steel	21,000	3.3
Bar joist (str stl)	5,900	0.9
Roof deck	3,700	0.6
Roofing & sheet metal	15,000	2.4
Ornamental metals	18,000	2.9
Folding bleachers & stage	10,000	1.6
Rolling door shutters	3000.00	0.0
Shelving & supports (metal)	800.00	0.1
Toilet stalls & shower cabinets	1,120	0.2
Vault door	550.00	0.1
Metal windows	12,100	1.9
Carpentry & millwork	27,200	4.3
Bulletin boards, chalk boards & trim	5,200	0.8
Hollow metal work & metal clad door	3,000	0.5
Met window stools & trim	1,900	0.3
Finish hardware	10,800	1.7
Lath, plaster & acs tile	15,750	2.5
Quarry tile	550.00	0.1
Wood flooring	10,000	1.6
Resilient flooring	7,800	1.2
Glass & glazing	5,200	0.8
Painting & decorating	10,500	1.7
Plumbing	51,629	8.2
Heating & ventilating	57,100	9.0
Electrical	43,608	6.9

In one week, Wall Street raises half a billion for construction

Investment bankers, who raise a good deal of the cash that finances construction, were having a pre-Christmas rush last week. In that one week, they polished off about half-a-billion dollars worth of municipal bond issues.

For one thing, the Mackinac Bridge finally got its financing. A group of investment bankers headed by Allen & Co. and Union Securities Corp., both of New York, put in a bid for the revenue bonds which will cost the Mackinac Bridge Authority 4.35% interest. That's a stiff rate for tax-exempt securities, but the bridge authority still isn't out of the woods.

Michigan State Senator Haskell L. Nichols has asked the state Supreme Court to rule on the constitutionality of the annual state grant of $417,000 for operation and maintenance of the bridge. General opinion is that the court will rule that the grant is constitutional, thus clearing the air and protecting investors who buy the issue from worries about later lawsuits. The case isn't expected to delay either construction or financing, since not much actual construction can be done until spring and the bonds actually are not scheduled to be delivered until about the middle of February. A court ruling is expected before then.

The underwriting group does not expect to resell the Mackinac bonds until early next year, presumably not until the Nichols lawsuit is decided.

• **Housing bonds**—Earlier last week competing groups of underwriters split a $121-million issue of local housing authority bonds, backed by the federal government. The cost to the borrowers was substantially lower than at the last sale of these bonds in September.

Net interest costs to the borrowing authorities was 2.47%, compared with 2.83% in September. (Of course, this is an average figure: Actual borrowing costs to the different authorities varied depending on their credit positions.) This is a drop of 36 points, compared with a drop of 23 points in the Dow-Jones municipal index over the same period. It shows that investors are starting to realize the value of a tax-exempt bond backed by federal guarantee. The federal government itself no longer issues tax-exempt securities.

• **Indiana toll road**—On the same day last week that the Mackinac issue was awarded, A nationwide syndicate of 475 investment firms bid for $280-million Indiana Toll Road Commission Revenue bonds at a net interest cost of 3.56%. This is the largest municipal issue in 1953, and the second largest turnpike issue ever to be sold. These bonds, which offer a higher yield in return for more risk to the investor, were snapped up immediately by investors and were soon selling at a premium.

Suprised, but mostly pleased: That's reaction to housing report

To most of those in the building industry who were willing to comment last week, the recommendations of the President's advisory committee on housing policies and programs (ENR Dec. 17, p. 22) came as a surprise. With half the membership of the advisory group drawn from the lender-investor field, industry people had looked for stronger proposals to pull the government out of the housing business.

Those who are opposed to certain parts of the report are careful to point out that it does not represent a legislative program. Some aspects of the report may well be reversed by decisions made during the recent White House conferences between the President and congressional leaders.

• **New Dealish?**—New Dealers took the report as vindication of federal housing policies during the last 20 years, but Housing & Home Finance Agency Administrator Albert Cole, chairman of the advisory committee, emphatically denied this. He said he disagreed with some of the recommendations and would advise the Administration not to follow them. But Cole will stand firm for continuation of the public housing method until the government finds a better way of filling the need for low-income dwellings.

The main thing that bothers home builders is the proposal by a majority of the committee that a privately financed corporation replaced the government's secondary mortgage market, the Federal National Mortgage Assn. The setup recommended by the majority would require institutions selling mortgages to the proposed "National Mortgage Marketing Corp." to buy stock in the corporation equal to 4% of the value of the mortgages they sold to it.

• **NAHB approves**—The National Association of Home Builders believes that the committee program in general is "bold, progressive, and practical" and that it would help the industry maintain a volume of one million new homes a year. But it thinks that there must be a broader support for the mortgage market than that suggested by the majority report.

• **Some unhappy**—Not everybody was happy about the committee report. Some life insurance company people believe that it is inflationary and might lead to trouble in case the real estate market later on should turn down sharply.

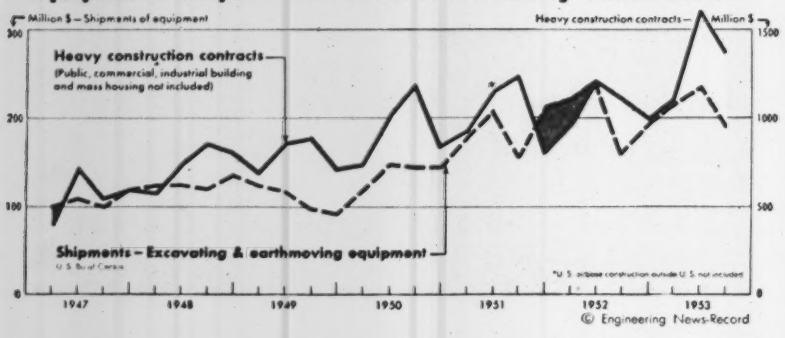
Savings & Loan people advocating government withdrawal from the housing business were distressed about proposed expansion of federal programs. They are of the opinion that their strong stand for eliminating public housing, as well as abolishing Fanny Mae, had been almost completely overridden.

Somewhat surprisingly, the National Association of Real Estate Boards praised the report. NAREB's president, Charles B. Shattuck of Los Angeles, said that "broadened home ownership opportunity is the key to the report." It offers means, he said, for carrying out the neighborhood conservation and renewal program that the real estate boards have been advocating. He believes that it opens the way for private ownership to supply decent housing for low-income families.

City housing officials were pleased. Oliver Winston, of Baltimore, president of the National Association of Housing and Redevelopment Officials, commended the advisory group for producing a comprehensive program. He hopes that it will pave the way to a stabilized housing policy, one that "will permit localities to plan several years in advance to improve housing conditions in their communities."

(*B&F continued on page 58*)

Equipment shipments move with heavy construction



Construction machinery shipments set new high for third quarter

Construction equipment shipments set a new high in dollar value in the third quarter of 1953, according to the Bureau of the Census, although they showed the usual seasonal decline from the second quarter.

Total third-quarter shipments were $186.5 million, pushing the total for the first nine months of this year to a record $638 million, nearly 2% above the previous high in 1952.

Third-quarter shipments of track-laying tractors were $84.6 million, nearly twice the volume in the similar 1952 quarter. Other types showing gains over last year were: machinery for mounting on tractors, heavy duty off-highways trucks and trailers; and portable blast hole drills. However, power cranes and shovels, road construction and maintenance machinery, and wheel-type tractors were off sharply.

On a nine-months basis, shipments this year are higher than in 1952 for:

Track-laying tractors, up 28% with $262.5 million; machinery for mounting on tractors, up 7% to $61.6 million; and portable blast hole drills, up 26% with $6 million.

On the down side are:

Power shovels and cranes, dipping 2% to $146.7 million; heavy duty off-highway trucks and trailers, off 3% to $25.2 million; road construction and maintenance machinery, down 23% to $97.5 million; wheel-type tractors, 34% lower with $37.3 million; and all other types, off 49% to $1.4 million.

Workmen's comp: Why is it so high?

New York investigator gets conflicting stories in trying to find out what's wrong with setup

The high cost of workmen's compensation—a particularly expensive item where the construction industry is concerned—has been getting a going-over in New York State. An investigator, Archie O. Dawson, has been appointed by Governor Thomas E. Dewey to look into costs and administration of workmen's compensation.

Dewey is particularly concerned with this subject because compensation rates in his state are about as high as anywhere in the U. S. In many categories, New York State rates are highest.

At a series of hearings held last week in New York City, one witness told Dawson: "The experience of New York is contrary to that of the nation and has veered steadily from the path taken in its early history." The witness, Joseph S. Keiper of the New York University Graduate School of Business, said that in New York fatalities and non-controversial industrial accidents and diseases have declined or remained steady, "but an important share of the cases which rest heavily on the subjective evidence has increased."

• **Blames the system**—Keiper told Dawson, who is conducting the hearing as a commissioner under New York State's Moreland Act, that the New York compensation system has trouble distinguishing between "the honest injury and the exaggerated claim." He blamed New York's hearing system, which is conducted by the State Workmen's Compensation Board.

State Commerce Commissioner Harold Keller testified that the system is hurting New York's industrial development. Keller called attention to the fact that although workmen's compensation costs are not a very big item in total operating costs, for the average company they can make the difference between operating at a profit or a loss.

This is even truer for construction firms than it is for manufacturers. A study of country-wide compensation rates made in 1951 by ENR found that construction was paying more than twice as much for compensation insurance as manufacturing firms pay (ENR Nov. 1, 1951, p. 116).

A difference of opinion developed at the hearing as to how much of the premium dollar which the employer pays goes into actual benefits to the injured worker, and how much money is spend to meet the costs of running the system.

Mary Donlon, chairman of the Workmen's Compensation Board, estimated that 40 cents of the premium dollar goes to the worker and his family as "indemnity benefits." She estimated that costs of medical care—which many observers would say were also indemnity benefits—took another 15 cents. The other 45 cents represented expenses of running the system. Henry Sayer, general manager of the New York Insurance Compensation Insurance Rating Board, which sets rates for the insurance companies handling this type of business, disagreed with Miss Donlon's opinion that the present system of benefits needs improvement. He submitted evidence to show that administrative expenses were lower than her estimate—about 33% in 1949.

Commissioner Dawson was critical of the fact that the insurance companies themselves did not testify at the hearing, although he understood that they believed that the Workmen's Compensation Board "is engaged in a giveaway program." Said he: "I asked for the facts, and not one insurance company has come forward."

So far, the hearings have not gone into the question of third-party liability. Under present provisions of the New York law, for instance, an employee of a general contractor injured by action of an employee of a subcontractor not only can collect comation insurance but also may sue the general contractor.

Get out of town

ODM should stop helping plants to bunch up

Tax incentives to industry for construction of plant protective facilities against bombing are a mistake, if the plants are located in critical target areas. That's the opinion of a plant-location specialist, who would like to see key defense plants relocated in rural districts.

Leonard Yaseen, senior partner of Fantus Factory Locating Service, of New York and Chicago, thinks that fast tax write-offs which encourage plants to stay in existing industrial concentrations will do more harm than good. The Office of Defense Mobilization recently began offering accelerated amortization of 100% of the cost of plant protection work on existing industrial plants in critical target areas (ENR Oct. 15, p. 21)

Yaseen's point is this: Even though the plant itself may not be seriously damaged by an enemy H-bomb or A-bomb attack, it would "be paralyzed by destruction of its surrounding lifelines—power, transportation and food and housing for its personnel." Says he: "The dispersal of new facilities to the outskirts of a metropolitan area does nothing to protect our productive capacity." He wants to see key plants taken completely away from major industrial areas and scattered to such an extent that it would be uneconomical for an enemy to attack them with thermonuclear weapons.

That's why Yaseen would like to see ODM give up its policy of encouraging existing defense plants to stay in critical target areas. Furthermore, ODM should no longer offer fast tax write-offs to new plants in such target areas. Finally, he suggests that "ideal plant facilities in rural areas" should be used immediately to decentralize existing war production.

Yaseen points out that aircraft production, steel production, oil refining, and ordnance manufacture are each concentrated in several major areas. His final estimate: One-third of defense production and 45 million people would be wiped out in a massive H-bomb attack.

Marshall forecasts busy 1954, thinks costs may go lower

Construction volume will stay on an even keel in 1954, but there probably will be a decrease in costs across the country. This is the forecast made by James D. Marshall, executive director of the Associated General Contractors of America, Inc.

Marshall believes that a rise in commercial building just about will offset a probable decline in heavy industrial construction. There may be a slight dip in contract volume below 1953.

Marshall bases his estimate of lower costs on the fact that competition among contractors is getting tougher. He expects the end result will be to weed out the less efficient, and thus lower costs. He also says that materials are now easier to get, permitting more efficient scheduling.

Marshall notes that construction men are "worrying a little" about unemployment. "Although we don't expect a recession," he said, "we want to plan ahead to avoid the shock of increased unemployment. After all, construction workers have worked a 40-hour week plus since World War II. The workers are geared to this steady income and will be more sensitive to cutbacks in hours and wages."

• Building contractors optimistic—Most builders expect to be busier in 1954 than this year, according to a survey of 114 building firms in 11 states just made by Standard Factors Corp., of New York, a finance company.

The survey indicates that many contractors expect to put up as many houses in 1954 as they did in 1953. Naturally, most of them also expect a heavy volume of remodeling and enlarging work. It's expected that this should more than make up for any decline in housing starts.

Business briefs . . .

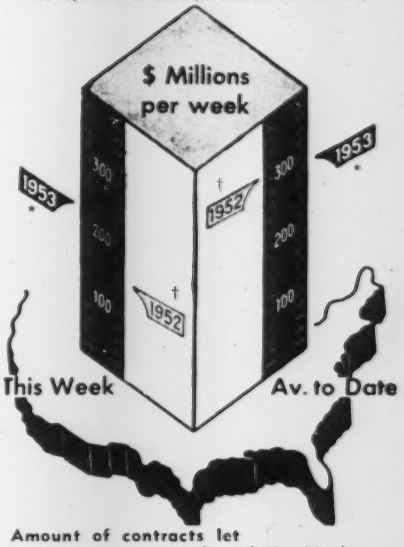
Massachusetts toll road financing is scheduled for some time between April 15 and May 15. The Turnpike Authority will borrow $200 million or $225 million to build the highway, which will run from Boston to the New York state line and connect with the New York State Thruway.

New Jersey Turnpike, top U. S. toll road, reports that revenues from traffic and concessions were up 21% for the first nine months of this year over 1952. Daily average traffic was 60,500, about 250% of that originally expected. Bus tolls are up 64% over the 1952 period; truck revenue up 46%.

Atlantic Refining Co., of Philadelphia, will sell $55 million of debentures partly to finance construction. The company expects capital expenditures in 1954 will be about same as 1953.

Activity This Week

As reported to ENR (in millions of dollars)



Amount of contracts let

	This Week*	Cumulative 52 wks 1953	1952	% chge
Federal	$37.0	$1,405.7	$4,501.1	−69
State and municipal	125.3	1,998.9	1,975.6	+23
Total pub.	162.3	6,404.6	8,576.7	−25
Total priv.	64.2	8,613.1	7,112.6	+21
U. S. total	**$226.5**	**$15,017.7**	**$15,689.3**	**−4**
Contracts by type of work				
Waterworks	$5.6	$243.6	$231.1	+5
Sewerage	3.5	423.3	304.3	+39
Bridges	73.7	745.0	413.9	+80
Highways	20.5	1,761.9	1,396.1	+26
Earthwork, waterways	27.3	371.3	495.8	−25
Buildings:				
Public, excl. hsg.	24.1	1,700.6	4,292.4	−60
Housg., pub.		373.0	606.5	−38
Housg., priv.	30.8	3,454.2	3,001.9	+15
Commercial	13.1	1,148.2	813.4	+36
Industrial	16.0	3,147.6	2,722.3	+16
Unclassified	11.9	1,649.0	1,381.6	+19
Total	**$226.5**	**$15,017.7**	**$15,689.3**	**−4**

*4-day week †3-day week

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $200,000

New capital for construction

(millions of dollars)

	Week of Dec. 17 1953	Cumulative 51 Wks 1953	% chge 1952-53
Corporate securities	$78.1	$1,281.7	+20
State and municipal:			
Excluding housing	106.0	4,281.6	+43
Housing	...	262.8	−17
Federal loans	0.8	112.4	−67
Federal aid	...	770.9	+40
Total non-federal	**$184.9**	**$9,709.3**	**+25**
Federal approp.:			
In U. S.	...	1,566.7	−79
Outside U. S.	...	28.9	−85
Total new capital	**$184.9**	**$11,304.9**	**−26**

ENR indexes		Base Years = 100 1913	1926	1949
Constr. cost	Dec '53	611.48	293.94	128.19
	Nov '53	611.92	294.15	128.28
Bldg. cost	Dec '53	435.90	235.63	123.91
	Nov '53	436.34	235.87	124.03
Volume	Nov '53	354	144	102
	Oct '53	528	215	153

WHAT'S AHEAD FOR '54?

THE ANNUAL REVIEW AND FORECAST ISSUE

will be coming your way February 18, 1954

as part of your regular subscription

Construction looks like one of the brightest spots in the U. S. economy in the coming year. In their much-quoted Annual Review and Forecast Issue this year, EN-R editors will analyze construction and the economy as a whole to give you:

• A LOOK AT THE YEAR PAST—

In which the editors will point out meaningful projects and news of the past year and assess their importance to the construction industry.

• A LOOK AT THE YEAR AHEAD—

The short-range picture will be projected in light of current trends and happenings of the past year. EN-R's "First Forecast", (See EN-R Oct. 1, 1953) will be up-dated and revised according to last-minute information.

• WHAT DOES THE FUTURE HOLD?—

A long-range look into the future based on developing trends in the industry. This will take into consideration new materials, new productive techniques and equipment, new political trends, and changing habits of the nation to identify patterns which can affect your future—and your pocketbook.

And, in addition, Engineering News-Record editors will pick out and analyze other trends, both short and long range, that may affect the future of the industry.

Be sure you'll have a copy of your own, for ready reference throughout 1954. Extra copies may be ordered in advance—$2.00 each.

NOTE TO ADVERTISERS—The Annual Review and Forecast Issue will be going to nearly 60,000 important men in construction. It's a natural for your sales messages, because of attentive readership and long life. Advertising forms closed January 28

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RATE: The rate for Official Proposal advertising is $1.50 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: January 12, 1954

New York International Airport Apron Floodlighting

THE PORT OF NEW YORK AUTHORITY
CONTRACT NYA-350.002

Sealed proposals for the furnishing and installation of a floodlight tower adjacent to the Operations Cargo Building at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y. until 2:30 P.M. on Tuesday, January 12, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $25.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

Bids: January 20, 1954

School Construction Projects Nos. 53-105 on St. Thomas and St. John and 53-504 on St. Croix Virgin Islands

Sealed bids in single copy for furnishing all labor, equipment, and materials and performing all work for the project described herein will be received until 3:00 P.M. Atlantic Standard Time January 20, 1954 in the Office of the District Engineer, Insular Division, St. Thomas Virgin Islands and then publicly opened and read aloud.

Information regarding bidding material, bid guarantee, and bonds, plans and specifications and other proposed contract documents are open for public inspection at the office of District Engineer, Insular Division, Thomas G. Mooney, Charlotte Amalie, St. Thomas, U. S. Virgin Islands; M. A. Dyer Company, 24 School Street, Boston, Massachusetts; Lester M. Marx, Room 2713 Interior Building, Washington 25, D. C.; A.G.C. Office, 1113 Congress Building, Miami, Florida; Builders Exchange, 16 Northeast 6th Street, Miami, Florida; Housing and Home Finance Agency, Room 313 N. Y. Department Store Building, 1064 Ponce de Leon, Santurce, Puerto Rico; and F. W. Dodge Corp., 119 West 40th Street, New York 18, N. Y.

Plans and specifications may be procured from the office of M. A. Dyer Company (Architects-Engineers) at 24 School Street, Boston, Massachusetts, upon deposit of the following:

Christiansted Consolidated School (Elementary portion)	$ 55.00
LaVallee Elementary School	30.00
Christiansted and LaVallee together	65.00
James Madison, Robert Herrick, and James Monroe Elementary Schools together	40.00
Cruz Bay Consolidated School	40.00
East End Elementary School	30.00
Horace Mann Elementary School	30.00
Benjamin Franklin Elementary School	30.00
Cruz Bay, East End, Horace Mann, and Benjamin Franklin together	65.00
All nine schools together	100.00

Deposit shall be only by certified check payable to the Treasurer of the United States, which will be refunded to bona fide bidders upon the return of plans and specifications in good condition within thirty (30) calendar days from the date of bid opening. A bona fide bidder includes any person who submits a bid for a general contract, but does not include a person who submits a quotation to the general contract bidders. To persons who procure plans and specifications upon payment of the above stated amounts, and who do not submit a bid, seventy-five (75) percent of the deposit amount will be refunded upon the return thereof in good condition within thirty (30) calendar days from the date of bid opening. No refund will be made for return after that time.

Bonds, etc.

Each bid must be accompanied by a satisfactory bid guaranty in an amount not less than 5 percent of the total bid.

The successful bidder will be required to furnish a performance bond and payment bond, each in the amount of 100 percent of the contract price.

No bid may be withdrawn until thirty (30) calendar days after the scheduled closing time for the receipt of bids.

The Government reserves the right to award a contract for any or all schools and/or sections on the basis of the basic bid for each school and/or section or any combination of schools and/or sections or by the acceptance of any or all of the alternates, whichever course is in the best interests of the United States.

Description of work

The construction includes:

Section A, St. Croix, Virgin Islands, Project 53-504.

1. Christiansted Consolidated School, (Elementary part) new construction.
2. LaVallee Elementary School, alterations and additions.

Section B, St. Thomas, Virgin Islands, Project 53-105.

Alterations and additions to:

1. James Madison Elementary School.
2. Robert Herrick Elementary School.
3. James Monroe Elementary School.

Section C, St. John, Virgin Islands, Project 53-105.

1. Cruz Bay Consolidated School, new construction.
2. East End Elementary School, addition.
3. Horace Mann Elementary School, new construction.
4. Benjamin Franklin Elementary School, addition.

Bids: January 12, 1954

New York International Airport Recircuiting of High Intensity Runway Lights for Runway 4-22

THE PORT OF NEW YORK AUTHORITY
CONTRACT NYA-150.001

Sealed proposals for the furnishing and installation of 5,000 volt cable for recircuiting the high intensity runway lights for Runway 4-22 at New York International Airport, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, January 12, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $25.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

INSURE COMPETITION

and get the lowest possible bid for your proposed work by placing your bids wanted advertising in this Section.

Don't limit competition to local bidding alone. Bring it to the attention of contractors the country over. They read this Section every week—make sure your bid is here where they can read it.

OFFICIAL PROPOSALS

Bids: January 26, 1954

Lincoln Tunnel Third Tube Fans, Motors and Transmissions

THE PORT OF NEW YORK AUTHORITY
CONTRACT LT-160.027

Sealed proposals for the fans, motors and transmissions for the Third Tube of the Lincoln Tunnel will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, January 26, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $50.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

Bids: February 23, 1954

Dwelling Unit Increment

HOUSING AUTHORITY OF THE CITY OF LOS ANGELES, CALIFORNIA
1401 EAST FIRST STREET
LOS ANGELES 33, CALIFORNIA
NOTICE TO GENERAL CONTRACTORS
CALL FOR BIDS

FOR PART 2—533 DWELLING UNIT INCREMENT
JORDAN DOWNS RECONSTRUCTION
PUBLIC HOUSING ADMINISTRATION
PROJECT NO. CAL. 4-16

LOCATION: Between 97th Street and 103rd Street at Grape Street, Los Angeles, California
Plans and Specifications
Prepared By
James R. Friend, A. I. A.
Architect
556 West Fifth Street, San Pedro, California
TErminal 3-5237

Invitation for Bids will be published November 30, 1953. Revised Plans and Specifications dated November 30, 1953 and Bidding Documents ready for distribution December 8, 1953.

Bids to be opened 2:15 P.M. (P.S.T.) February 23, 1954.

For further information regarding bidding Telephone ANgelus 2-2121, Extension 55.

Bids: January 5, 1954

Contract No. 43

WEST VIRGINIA TURNPIKE COMMISSION

Sealed proposals will be received at the office of the West Virginia Turnpike Commission, 1340 Wilson Street, Charleston 5, West Virginia, until 1:00 P.M., Eastern Standard Time, and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia, until 2:00 P.M., Eastern Standard Time, on January 5, 1954, at which time and place said proposals will be publicly opened and read for Contract No. 43 which includes the construction of permanent combined restaurant and service station buildings complete with mechanical and electrical services located at the following service areas:

Bluestone Beckley Morton

and other related work including fuel tanks and piping, sewage disposal systems, sidewalks, paving and landscaping.

Contract documents may be seen and may be inspected by prospective bidders during office hours after December 11, 1953, at the office of Howard, Needles, Tammen & Bergendoff, 804 Greenbrier Street, Charleston, West Virginia, or at the office of Greife & Daley, Architects, 811 Lee Street, Charleston, West Virginia.

WEST VIRGINIA
TURNPIKE COMMISSION
D. H. Morton, Chairman

OFFICIAL PROPOSALS

Bids: January 5, 1954

Contract 440

ELECTRIC CONDUCTORS, CABLES, ETC.

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time, on Tuesday, January 5, 1954, for Contract 440, for furnishing, testing and delivering approximately 82,000 feet of electric conductors and cables, power panelboards, safety switches and fuses, complete in every respect, in the numbers and sizes specified, for installation in the Neversink and East Delaware intake and outlet chambers and the Downsville release water chamber of the Delaware system, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of one thousand five hundred dollars ($1,500.00) for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety etc., can be obtained in Room 1316 at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: January 13, 1954

Construction of Two Anchorage Superstructures

DELAWARE RIVER PORT AUTHORITY
ADMINISTRATION BUILDING
CAMDEN, NEW JERSEY
ANCHORAGE SUPERSTRUCTURES
Schedule "A"—Philadelphia Anchorage Superstructure
Schedule "B"—Gloucester Anchorage Superstructure

Sealed bids will be received for the construction of Two Anchorage Superstructures for a Suspension Bridge over the Delaware River connecting Packer Avenue in Philadelphia, Pennsylvania and Gloucester City, New Jersey, known as Contract No. 3 at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 1:30 P. M. Eastern Standard Time, January 13, 1954, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

A proposal on Schedule "A" and or Schedule "B" must be accompanied by a certified check in the sum of One Hundred Thousand Dollars ($100,000.00) each payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company, having an office or place of business either in Philadelphia, Pennsylvania or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the Contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received, to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous for the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

OFFICIAL PROPOSALS

Bids: January 8, 1954

State Highway Construction

Sealed bids will be received by the State of Tennessee Department of Highways and Public Works at their Offices in the Cotton States Building, Nashville, Tennessee, until 10:00 o'clock A.M. January 8, 1954.

DAVIDSON COUNTY:

Project No. 17-06S-1-(1) Pt. III—The Construction of the superstructure for Victory Memorial Bridge over Cumberland River in Nashville, State Route No. 26.
Project Length—0.349 Miles
Working Days—250
(Unloading Point—Nashville)

Financial Equipment and Experience Questionnaires must be on file with the Department fifteen (15) days before the date of the letting.

No Proposals will be issued after 9:00 o'clock A.M. Friday, Jan. 8, 1954.

THE ATTENTION OF THE BIDDER IS DIRECTED TO CHAPTER 135, ACTS OF 1945.

Contractor must prequalify with the Department of Highways and Public Works in accordance with Chapter 80 of the Public Acts of 1929, before any proposals will be furnished. PROSPECTIVE BIDDERS MUST HAVE FILED THEIR QUESTIONNAIRES FOR QUALIFICATION FIFTEEN DAYS BEFORE THE DATE OF LETTING.

QUESTIONNAIRES WITHIN ONE YEAR OF JULY 1, 1953 OR LATER, WILL BE REQUIRED OF ALL PROSPECTIVE BIDDERS IN THIS LETTING.

Must be certified by a certified public accountant.

The right to reject any and all bids is reserved.

W. H. Leech
Commissioner

The CONTRACTOR—

like a GENERAL

Prepares for Victory

BEFORE he goes into battle on a new job he sees that his army of construction workers is *equipped*.

Looking over ENGINEERING NEWS-RECORD he sees, let us say, a new type of rubber-tired wheelbarrow. Looks into their success on other jobs—and orders them. He sees a crawler crane, which is particularly capable of setting steel—some of the big steel erectors are using many of them. He contracts for one to be delivered to the new job. New developments in wire rope—successful use of special cements—roofing plank or composition siding of light weight, speedily placed at low cost—and other elements that save him time and money—are shown in picture and text.

Alert Contractors, who not only read the proposals for new jobs, but who follow the *news of the manufacturers* in the display advertising pages—get the most out of their ENGINEERING NEWS-RECORD. They are the men who are able to estimate a job close enough to "*land it*"—and who make money on the contract.

OFFICIAL PROPOSALS

Bids: January 4, 1954

15,000 Gallons Paint Vehicle

THE PORT OF NEW YORK AUTHORITY
PROPOSAL NO. 315

Sealed proposals for furnishing 15,000 gallons varnish type vehicle in 55 gallon nonreturnable drums for delivery to the George Washington Bridge, New York Emergency Garage, Washington Heights, New York, will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111 8th Ave., New York 11, until 11:00 A. M. (E.S.T.) Monday, January 4, 1954, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

Bids: January 5, 1954

30,000 Lbs. Aluminum Paste

THE PORT OF NEW YORK AUTHORITY
PROPOSAL NO. 316

Sealed proposals for furnishing 30,000 lbs. of aluminum paste in 100 lb. metal containers for delivery to the George Washington Bridge, New York Emergency Garage, Washington Heights, New York, will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111 8th Ave., New York 11, until 11:00 A. M. (E.S.T.) Tuesday, January 5, 1954, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

Bids: January 28, 1954

Construction of Sewage Treatment Plant

CITY OF SOUTH BEND, INDIANA
SEWAGE WORKS IMPROVEMENTS

The City of South Bend, Indiana will receive sealed Proposals for the construction of certain sewage works improvements including sewers and a Sewage Treatment Plant until 10:00 A. M. Central Standard Time on the 28th day of January, 1954, at the office of the Clerk of the Board of Public Works and Safety, City Hall, South Bend, Indiana.

All Proposals received will be publicly opened and real aloud in the Office of the Board of Public Works and Safety at South Bend, Indiana at 10:00 A. M. on January 28, 1954.

Documents

The contract documents including plans and specifications are on file and available for inspection at the office of the Board of Public Works and Safety of the City of South Bend at South Bend, Indiana.

Copies of documents including plans and specifications required for review or bidding purposes, may be obtained only from the Clerk of the Board of Public Works and Safety by depositing with the Clerk for each set of documents so obtained, the amount stated in the following listing.

Proposed Contract Designation		Amount of Deposit
No. P-5	Concrete Pipe Purchase for Interceptors	None
No. P-6	Concrete Pipe Purchase for Interceptors	None
No. 5-A & 5-B	Interceptor Installation	$15.00
No. 6	Sub Interceptors	15.00
No. 6-A	River Crossings	15.00
No. 7	Sewage Lift Stations	15.00
No. 11	Sewage Treatment Plant	85.00

The full amount of the deposit for one set of documents and one-half of the deposit for any additional sets of documents will be refunded to each bidder who submits a formal proposal to the City of South Bend and who also returns the plans (and specifications on additional sets) in good condition to the Clerk of the Board of Public Works and Safety within ten (10) days after his bid security has been returned to him.

Equipment manufacturers, sub-contractors, and others who do not submit formal proposals to the City will be refunded one-half (½) the amount of the deposit for all sets of complete documents including plans and specifications returned in good condition to the Clerk of the Board of Public Works and Safety within ten (10) days after the opening of bids. No refund will be made this ten (10) day period.

for documents received by the Clerk after

OFFICIAL PROPOSALS

Bidding and Contract Requirements

A cashiers check (s), certified check (s) or bank draft (s) drawn on a solvent bank or banks payable without condition to the City of South Bend Indiana, in an amount not less than five per cent (5%) of the bid shall be submitted with each proposal. The City of South Bend proposes to complete financing arrangements for this improvement within a period of ninety days after construction bids are received. The bid securities of all bidders, except the security submitted with the lowest acceptable bid, will be returned within a ten day period following the time of receipt of the bids. The bid security of the lowest acceptable proposal will be returned on request after the City has made a conditional award to the successful bidder if a satisfactory performance bond has been delivered to the City. The conditional award will not be in effect until the City has been successful in raising the required funds for payment of Project Costs. Provided it proves impossible to raise the required funds, the conditional award will be cancelled by the City and the City shall not then be liable for any payments whatsoever to the Contractor. Extension of time beyond the ninety day period of the conditional award may be made only by mutual agreement between the City and the Contractor.

The City of South Bend, Indiana reserves the right to reject any or all Proposals, to waive any informalities or irregularities in the bids received, or to accept any proposal on any individual proposed Contract. The successful bidders will be required to furnish a satisfactory performance bond in the sum of the full amount of the contract, or contracts.

The proposal as submitted shall be properly and compietely executed on the proposal form included in the contract document, including the non-collusion affidavit required by the Statutes of Indiana, and including a fully prepared and executed Questionnaire General Form No. 96-A as prescribed by the State Board of Accounts of Indiana.

Wage rates for this work shall not be less than the prescribed scale of wages as determined pursuant to provisions of Chapter 319 of the Acts of the General Assembly of Indiana of 1935.

Description of Improvements

Proposed Contracts P-5 and P-6—Pipe Purchase for Interceptors

This proposed contract includes the furnishing only of reinforced concrete pipe in the following approximate quantities.

Proposed Contract No. P-5:

6,810 lineal feet 96" Diameter Reinforced Concrete Culvert Pipe.
75 lineal feet 60" Diameter Reinforced Concrete Culvert Pipe.

In event the alternate Items of Contract No. 5-B are accepted, the City of South Bend reserves the right to award the Contract for the pipe based upon 5,730 lineal feet of 96" Reinforced Concrete Culvert Pipe.

Proposed Contract No. P-6:

890 lineal feet of 36" Diameter Reinforced Concrete Culvert Pipe.
20 lineal feet of 30" Diameter Reinforced Concrete Culvert Pipe.
690 lineal feet of 24" Diameter Reinforced Concrete Culvert Pipe.
625 lineal feet of 15" Diameter Reinforced Concrete Culvert Pipe.
3,810 lineal feet of 12" Diameter Reinforced Concrete Culvert Pipe.

Any person, or company submitting a bid for furnishing the pipe required on this Project, must submit with his Proposal certified data that he has satisfactorily manufactured pipe of the size required and in comparable quantities for a period of at least five (5) years. Such data must also state the quantity and location of the pipe supplied and its service record. He shall also submit with his Proposal satisfactory evidence that he has the pipeforms and accessories available in the sizes and type required. The Bidder shall also submit with his Proposal a statement indicating the expected plant capacity to be made available on this Project, in terms of lineal feet per working day for finished pipe, for each of the pipe sizes involved.

The pipe must be made available to the installing Contractor at a storage yard in South Bend located within six (6) miles of the mid-point of the proposed sewer work. The pipe shall be stored so that it is accessible to trucks and heavy hoisting equipment in all weather conditions.

Proposed Contracts No. 5-A and 5-B—

Interceptor Installation:

For each of the Proposed Contracts 5A and 5B the work includes the furnishing of all labor, materials (except reinforced

OFFICIAL PROPOSALS

concrete pipe) and equipment for the installation complete of intercepting sewers, including manholes, special reinforced concrete intercepting structures, and miscellaneous appurtenances. Reinforced concrete pipe required will be furnished to the Contractor by the City.

The Proposal Form contains a provision under which the bidder agrees that the placing of the order for the purchase of the concrete pipe by the City constitutes the entire performance required of the City in respect to this item, and that any failure of the pipe manufacturer to deliver pipe at the specified time shall not result in any claim by the Contractor against the City for such non-delivery.

Approximate lengths of sewer to be constructed are as follows.

Contract No. 5A (Sta. 23+35 to 59+64)
3,585 Lineal Feet 96" Pipe Sewer
150 Lineal Feet 36" Pipe Sewer

Contract No. 5B (Sta. 57+21 to 89+87)
3,225 Lineal Feet 96" Pipe Sewer
or
2,145 Lineal Feet 96" Pipe Sewer
and
1,080 Lineal Feet 102" Pipe Sewer
75 Lineal Feet 60" Pipe Sewer
200 Lineal Feet 10" Pipe Sewer
575 Lineal Feet 8" Pipe Sewer

Proposed Contract No. 6—Sub Interceptors:

Approximate quantities of pipe to be installed under this Proposed Contract are as follows:

6,035 lineal feet reinforced concrete pipe ranging in sizes from 12" to 36"; 2,240 lineal feet of plain concrete or vitrified clay pipe in 6" and 8" sizes or cast iron pipe; 965 lineal feet of cast iron pipe ranging in sizes from 6" to 12".

The work includes the furnishing of all labor, materials (except reinforced concrete pipe) and equipment for the installation complete of sub-intercepting sewers, including manholes, special reinforced concrete intercepting structures, completion and revision to existing intercepting structures, and miscellaneous appurtenances. All reinforced concrete pipe will be furnished to the Contractor by the City.

The Proposal Form contains a provision under which the Bidder agrees that the placing of the order for the purchase of the concrete pipe by the City constitutes the entire performance required of the City in respect to this item, and that any failure of the pipe manufacturers to deliver pipe at the specified time shall not result in any claim by the Contractor against the City for such non-delivery.

Proposed Contract No. 6A—River Crossings

The work under this Proposed Contract will require the construction of four (4) cast iron pipe and one (1) cast iron pipe or reinforced concrete pipe sewers under the St. Joseph River, including chambers and appurtenances.

Proposed Contract No. 7—Lift Stations

The work under this Proposed Contract will require the construction of three (3) sewage lift stations, the completion of two (2) sewage Lift Stations, and appurtenances thereto, including inlet piping, ejectors, compressors, and electrical equipment.

Proposed Contract No. 11—Sewage Treatment Plant

The work under this Proposed Contract will require the construction under one general contract of a sewage treatment plant of the split activated sludge type with separate sludge digestion with a nominal plant capacity of 48 million gallons per day.

Plans and specifications for this project were prepared by Consoer, Townsend & Associates, Consulting Engineers, 351 East Ohio Street, Chicago 11, Illinois.

Dated at South Bend, Indiana
this 15th day of December, 1953

Raymond S. Andrysiak
Irving A. Hurwich
Granville P. Zigler
BOARD OF PUBLIC WORKS
AND SAFETY
SOUTH BEND, INDIANA

Contractors Watch This Section—

for new projects. Publish your announcements through the proposal sections of *Engineering News-Record* and get their bids.

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.50 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.
POSITION WANTED & INDIVIDUAL SELLING OPPORTUNITY WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.50 a line an insertion.

INFORMATION:
BOX NUMBERS count as 1 line additional in undisplayed ads.
DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:
The advertising rate is $17.10 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

Send NEW ADVERTISEMENTS: To New York City Office, 330 W. 42nd St., N. Y. 36 for January 7th issue closing December 24th

CHIEF DRAFTSMAN—STRUCTURAL ENGINEER

WANTED — Chief Draftsman — Structural Engineer fully qualified to take complete charge of Drafting Department (about 30 men) of a Company located in northerly area of the Central States.

This is a Structural Steel Fabricating Plant and applicants must have gained experience with a fabricating concern.

Replies will be treated confidentially and appointments made for personal interviews.

P-1061, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

Wanted
TRAINED BUILDING CONSTRUCTION ESTIMATOR

To head the department of an established firm located in Central Texas. Excellent salary and opportunity for permanent employment to a qualified man. Must be experienced and able to handle entire estimate. Please give qualifications and references.

P-9978, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

Rewarding Dignified Opportunity for Sales Engineer

Does your present professional activity require contacting top utility, industrial executives or structural consulting engineers and architectural offices in your community?
With patience and perseverance, you can increase your income quite substantially, without embarrassment to, or interference with, your present professional standing. No investment is required, or samples to carry; no pressure tactics involved.
We are established manufacturing company, financially sound, conservative, and highly regarded in our field. Unusually close cooperation in protected territory, to serious and persuasive sales engineer in rewarding pleasant association. Write us in confidence.

P-1116, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

Fine Opportunity For CAPABLE Construction Equipment SALESMEN

Established N. Y. State Distributor of nationally known lines has attractive openings for two able men. Exclusive territories—liberal commissions. Excellent possibilities for right parties with chance to advance to Sales Mgr. and to invest in long established lucrative business. Replies kept strictly confidential.

SW-1104, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

STRUCTURAL ENGINEER

College degree preferred, but not essential. Ten years experience desired. Large chemical manufacturer in Northeastern Ohio. Write qualifications to

P-1132, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

CHIEF ENGINEER with engineering company specializing in chemical plant design. This position requires a man with experience directing the design work of others including project engineers. This is a permanent position with a growing organization. Send complete resume of education and experience to P-9870, Engineering News-Record.

SALES ENGINEER to obtain contracts for engineering services. Contact work will be with industries in the Southwest and headquarters will be Atlanta. We require a man who has actual experience selling engineering services and can show results. Send complete information to P-9871, Engineering News-Record.

ESTIMATOR EXPERIENCED in quantity take-off, determination of unit prices and preparation of complete estimates on building construction and mechanical installations. Work is located in the Southeast. Good pay in permanent position for right man. P-9872, Engineering News-Record.

STRUCTURAL STEEL detailers wanted: experienced; employee benefits, good pay. Five day week. Southern Engineering Company, P. O. Box #1087, Charlotte 1, N. C.

WANTED: MASTER Mechanic, experienced in heavy construction, diesel and electrical equipment. Give full details with your first answer. P-9916, Engineering News-Record.

SEWER & WATER Foreman: Prefer Cleveland man if possible. Must know sheathing & braining and be able to handle men. Must take full charge from start to finish. Very high salary for qualified man. We do developments & Municipal work—enough work on hand right now to last the middle of summer. Steady work straight through. Position now open. P-1111, Engineering News-Record.

MANUFACTURER OF heavy duty, wheeled tractors needs man who understands field merchandising problems, who knows industrial tractor dealers and their organizations, who knows tractor accessory field, and who knows enough tractor engineering to correlate entire program of sales and engineering of tractors and accessory line. Fine opportunity for right man. Job has been done so far by company principal who must now devote efforts to other phases of operations. Would be headquartered in East with a considerable amount of traveling out of factory. Advise personal data, present job, past experience, references, etc. Reply to Box P-1113, Engineering News-Record.

MANAGER OF FOREIGN Construction Department with young, aggressive and expanding Southern firm. This position requires a man qualified to completely organize, foreign department. Duties will include securing organizing and prosecuting building and heavy construction work. Send complete resume of experience, education, references and availability to Box P-1135, Engineering News-Record.

POSITIONS WANTED

MANAGEMENT EXECUTIVE. Largest and best known prefabricator of homes in the Southwest in change-over from Government Contract Work to Fabrication of FHA approved homes in the low-cost bracket requires Hard-Hitting Revenue-Producing General Manager. Experience in home fabrication on large scale and thorough familiarity with procedures in handling paper work on mortgage financing required. Permanent and lucrative position for highly qualified man. Give full information in first letter. All information held confidential. Address P. O. Box 7265, Dallas, Texas.

CONSTRUCTION SUPT. for Queens, N. Y. Public School—full responsibility. Start about Feb. 1, 1954—send complete resume. P-1119, Engineering News-Record.

OFFICE PROJECT Engineer 30-40 for contractor specializing in competitive bidding public buildings. Position requires job expediting, purchasing, and checking details. Graduate engineer or architect preferred. Stanley W. Newman Co., Mobile, Alabama.

SELLING OPPORTUNITIES OFFERED

PROGRESSIVE EXPANDING Organization servicing construction trades desires sales representatives in the following areas in New York State: Albany, Poughkeepsie, Rochester, Batavia, Jamestown. For interviews in your area write R. J. Thomson & Co., Inc., 2304 Brewerton Road, Syracuse, New York.

SALES ENGINEERS — Pittsburgh, Pennsylvania with established national concern selling prefabricated metal products to engineering and construction markets. Position offered is permanent and presents excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Age 24 to 30. Car furnished. Complete training program. Salary and bonus. SW-8254, Engineering News-Record.

EMPLOYMENT SERVICES

SALARIED PERSONNEL $3,000-$25,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

OVERSEAS CONSTRUCTORS—Comprehensive Digest Guide to most active constructors—engineers hiring Americans for overseas projects—$1.00. Cove-McKane International, P.O. Box 126, N. Y. 4, N. Y.

POSITIONS WANTED

PROJECT MANAGER — 20 years experience steam and hydro plants, heavy industrial work, foundations. Will accept either foreign or domestic. Available immediately. PW-9988, Engineering News-Record.

MECHANICAL ENGINEER desires foreign employment in Europe or Latin America. Age 35, married, one child. Previous Latin American experience. Spanish speaking. Over 15 years heavy experience in power, mining, construction, inspection. Presently employed by large, Southwestern construction firm but available on short notice. Excellent references. Inquiries invited. PW-9747, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT — 20 years experience power plants, pulp mills, sewage disposal and heavy foundation work. Desire locate in Florida or southeast U.S. Available immediately. PW-9989, Engineering News-Record.

POSITIONS WANTED

BRIDGE ENGINEER, wants highway bridge design and drafting on subcontract basis. Will take preliminaries and furnish contract drawings, or design only, on lump sum or percentage basis. Thoroughly experienced, registered Eastern States. Box PW-1035, Engineering News-Record.

GENERAL SUPT., Single, 45 yrs of age, 15 yrs, as supt. 7 yrs. one Co. experience in pipe-line, Asphalt, reinforced concrete, bridges and commercial bldgs. best of references, last employer may be contacted, salary plus percentage. PW-1036, Engineering News-Record.

QUARRY—PROD. Mgr.-Supt. seeks medium to large capacity quarry connection, thoroughly experienced every phase modern operation. Married, 48 yrs. of age. Locate anywhere in U. S.—splendid references. PW-1040, Engineering News-Record.

LANDSCAPE ARCHITECT — civil engineer, Reg. Land Surveyor, age 36, 14 years diversified experience interested in good paying responsible position. Available on 30 days notice, U. S. or o'seas. PW-1058, Engineering News-Record.

GENERAL FOREMAN, Forms, buildings, cork insulation (refrigeration) pile driving, carpenter shop and railway construction. Over 25 years experienced. Six years foreign experience, Age 53 yrs., sober and reliable. Available at once, foreign or U. S. A. PW-1027, Engineering News-Record.

SAFETY ENGINEER Available. Highly experienced in organization of accident and fire prevention in construction and mfg. Present program has accident rates 1/10 of industry average, attained at minimums cost. Full-time or consulting basis, to large or small employer. PW-1129, Engineering News-Record.

ENGINEER—STRONG interest and definite talent for problems in design of products. Desires challenge to creative imagination as in the development of New products using new materials, mechanisms, or shapes. Talented in the use of the hands as in preparing models etc.; presently a successful engineer in another field. Desires transition because of proven interest and ability. PW-1110, Engineering News-Record.

CONCRETE & HIGHWAY Engrg. Student, I.C.S., age 27, married, 1 child, seeks position concrete-control work Canada or U.S.A. 6 years European and overseas experience in field & laboratories Masseoncrete, road concreting, culverts, manufacture of coner. pipes, floortiles. Costing, estimating and stores experience. Languages. PW-1039, Engineering News-Record.

CIVIL ENGINEER Graduate 28, 4 years of varied steel and concrete experience seeking sales position with future New York preferred. PW-1103, Engineering News-Record.

CHIEF ESTIMATOR—Will be open for a position in six weeks. Thoroughly familiar with all phases of take-offs. Pricing, sub bids for commercial and industrial buildings. PW-1096, Engineering News-Record.

ELECTRICAL ESTIMATOR Engineer—industrial commercial buildings. Estimates, engineering drawings, job supervision. Long experience. Will relocate. PW-1089, Engineering News-Record.

CIVIL ENGINEER, 43, public works, excellent planner, high grade professional experience; strong in personal relations, good analytical appraiser, now available. PW-1083, Engineering News-Record.

CIVIL ENGINEER, 37, BSCE in 1940, 10 yrs. experience in excavation and pier and bridge construction desires permanent connection with chance for increasing responsibility. PW-1085, Engineering News-Record.

SELLING OPPORTUNITIES WANTED

Sales Executive 20 years experience wishes to represent manufacturer in Eastern States on basis of drawing account against commission. Firm must be A-1. For references & particulars write box RA-9952, Engineering News-Record.

MANUFACTURERS AGENT seeks new lines. Straight Commission or Jobbing basis. Excellent connections Architects, contractors—New York State. P.O. Box 2946, Albany, N. Y.

BUSINESS OPPORTUNITY

Wanted to Buy Surveying and Mapping busi- ness. Reply Box BO-9923, Engineering News-Record.

MIDWEST FABRICATOR

(1) SENIOR DESIGN ENGINEER
5 years or more experience

(1) ESTIMATOR
5 years or more experience

(2) SENIOR DRAFTSMEN
3 years or more experience

We are a large steel fabrication company in business over 35 years, specializing in the design and manufacture of welded pressure vessels, structural steel and heavy plate work. Due to our new expansion program, we are in need of the above type men. These are permanent positions with excellent salaries and opportunities for advancement. If you are qualified, please write, giving detailed resume of education and experience. All replies will be held confidential.

P-1124, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

Wanted
EXECUTIVE
MECHANICAL ENGINEER
GENERAL SUPERINTENDENT
OF MAINTENANCE

Company operating several maintenance shops and large quantities of heavy construction equipment seeks the best qualified engineer to take the top responsibility for all maintenance costs.

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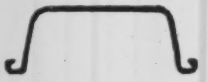

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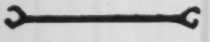

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Similarly, the drive is two wheeled on the standard model, but four-wheel traction is also available.

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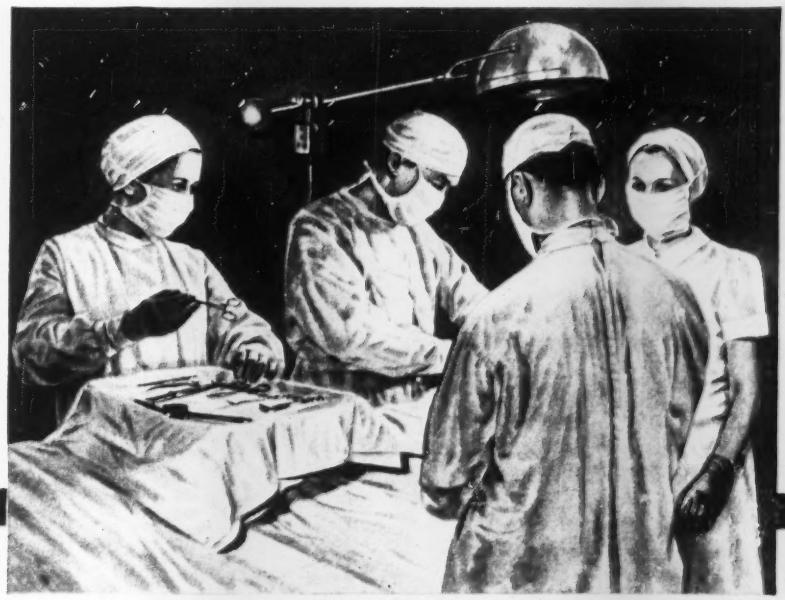

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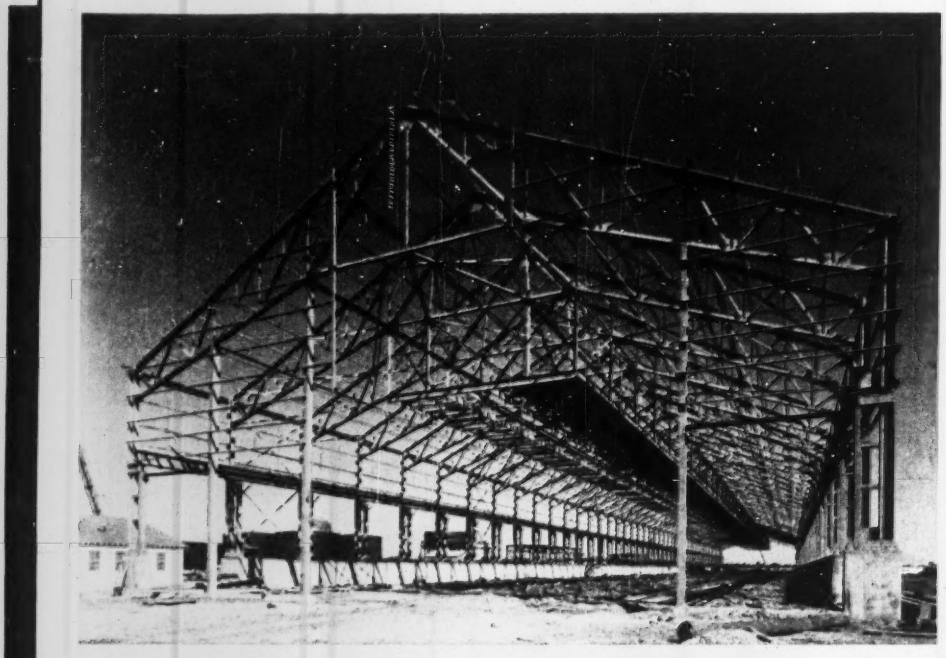

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it possible to combine the three lifting and measuring factors in one instrument.

Not only can the indicator be used to make crane work safer, but it can also be helpful in preventing truck overloading. MARTIN-DECKER CORP., 3431 CHERRY AVE., LONG BEACH, CALIF.

Fire extinguisher system built into new paint

A new paint development has received a fire retardant classification from the Underwriters' laboratories. When exposed to flame, Fyr-Kote, as it is called, releases carbon dioxide and calcium chloride—both having fire extinguishing properties.

The flat interior wall finish is reported to be extremely washable, withstanding more than 25 cycles of scrubbing with strong washing soda and boiling water. It may be used on steel, wood, masonry or wallboard. MORRIS PAINT & VARNISH CO., 27TH & DOUGLAS STS., ST. LOUIS, MO.

Kerosene offers savings in electric plants

Designed to lower the cost of operating fuel, Kohler's new 2 and 3.5-kw electric plants are available with kerosene-gasoline power units.

The new unit includes a 1¼-gal gasoline tank to provide fuel for starting the L600 engine. When the engine reaches normal operating speed and temperature, a valve is turned to switch the fuel supply to kerosene. Before stopping, the valve is turned back to replace the kerosene in the carburetor and fuel lines with the more easily started gasoline.

Engine modifications for kerosene operation include substitution of a low compression cylinder head, special intake and exhaust manifold and alterations to the cylinder block and carburetor. KOHLER CO., KOHLER, WIS.

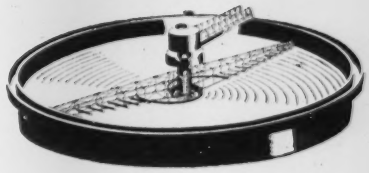
Portable drawing board weighs only eight ounces

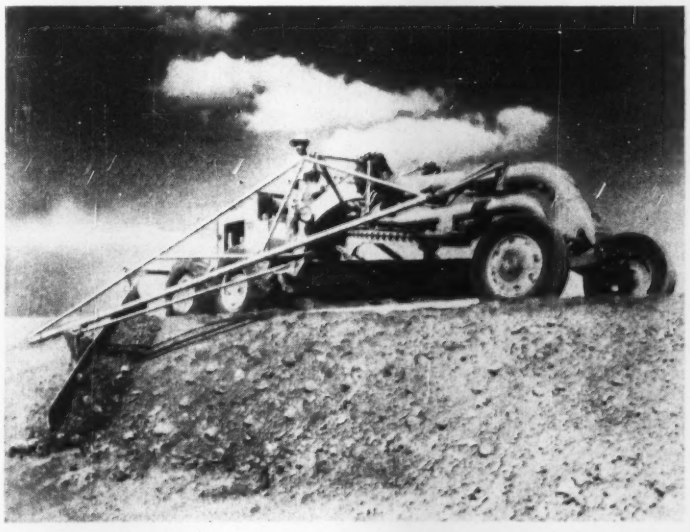
A portable drawing board molded of clear polystyrene plastic weighs eight ounces and, since it measures only 9¾ x 12¼ in., may be slipped into a briefcase.

The board is fitted with four corner clamps for attaching 8½ x 11 in. sheets without the use of thumbtacks or tape. These clamps are recessed into the plastic so that a straightedge or triangle can ride over them without interference.

Two retractable metal straightedges, one horizontal and one vertical, make

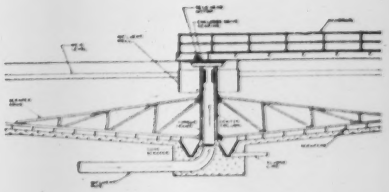
(Continued on page 76)





SUSPENDED from the side of a motor grader, the Grade-More slope grader cuts fore-slopes and shoulder lines while the grader remains on the level. The 16-ft moldboard is controlled from the operator's seat through mechanical linkage with the regular grader controls. Shown here attached to an Allis-Chalmers AD-4, the attachment is designed also to fit Adams and Caterpillar models. Hasselbalch Fintzell Co., 215 N. 12th St., Omaha, Neb.

Center-Discharge
Center-Feed
Clarifiers



One reason for the efficiency of Hardinge Clarifiers is the fact that the influent goes directly to a central stilling well and the underflow also is centrally removed. This promotes quick disposal of the heavier solids immediately upon entry—makes less work for the rotating sludge scrapers. The clear effluent overflows the tank periphery, where velocity is at a minimum. Bulletin 35-C-53.

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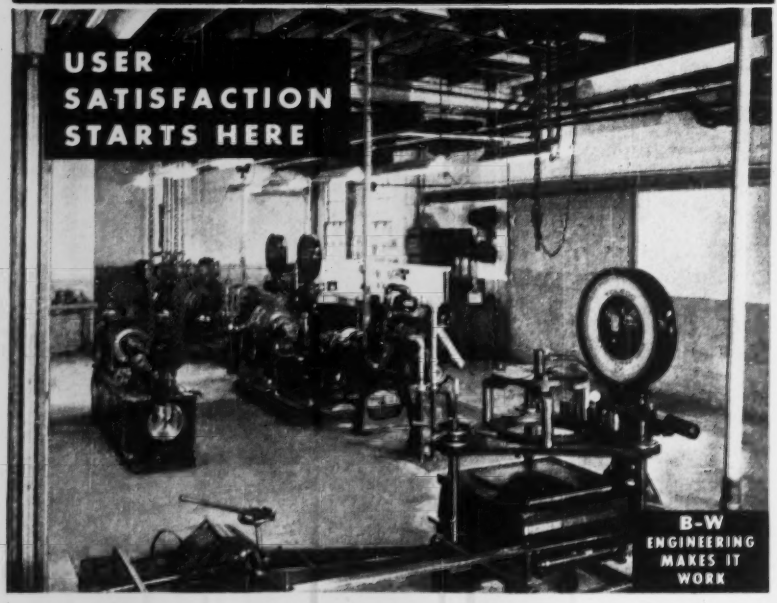
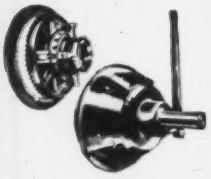


Every type and size ROCKFORD CLUTCH must pass torque, strength, pressure, spin, heat, balance, wear, deflection, friction, run-out, flatness and endurance tests before being put into production. These torture tests are made on specially designed, accurate, clutch-checking machines. Let our engineers give *your* products the benefit of ROCKFORD test-proved CLUTCH reliability.



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it possible to do precision work without the use of a T-square. Tension clamps on the underside of the board provide storage for triangles. GRAPHOSTAT CO., 110 EATON PL., EAST ORANGE, N. J.

New Products briefs . . .

• **Twist drills**—High-speed twist drills have been added to the line manufactured by The Hayden Twist Drill Co., 8626 Lyndon Ave., Detroit, Mich.

• **Geared flexible couplings**—A new line of geared flexible couplings designed for high speed and high torque application has been developed by the Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill. They are reported to transmit power efficiently while accommodating a reasonable amount of shaft misalignment and end float. Ten standard sizes are available, with bores ranging from 1 to 6 in. and with horsepower rating at 100 rpm ranging from 2 to 450.

• **Spray cleaner**—Continuous spray cleaning by solvent, emulsion or aqueous solutions is reportedly made easier with the new Model B-202-M siphon spray gun manufactured by the John B. Moore Corp., P. O. Box 3, Nutley 10, N. J. The gun is designed to draw cleaning fluid directly from a 55 gal drum.

• **Torque control**—GM Allison torque converters have been applied to the Orton Crane and Shovel Co., 608 S. Dearborn St., Chicago 5, Ill. product—the one-man Aero-Crane. The application of the converter is said to increase the operating facility with pinpoint control.

• **Welding rod**—A new hard surface gas welding rod with reportedly high resistance to sand and earth abrasion has been developed by Marquette Mfg. Co., 307 E. Hennepin St., Minneapolis 14, Minn. Called the No. 10 gas hard rod, it has been designed for use with sand and gravel equipment and earth-moving machinery because of its alleged ability to build up parts subject to severe wear and abrasion but low impact.

• **Conduit straps**—Greater strength, less weight and improved support are reported for the new line of malleable iron straps manufactured by the Thomas & Betts Co., 15 Park Pl., New York, N. Y. The straps are designed for rigid conduit ½ to 6 in. in diameter and for E.M.T. ½ to 2 in

FILMS

Sheet Metal in Building Construction

A 46-min, 16mm, sound-color film produced by Revere Copper and Brass, Inc. 230 Park Ave., New York 17, N. Y. Of interest to architects, specification writers and sheet metal men generally.

Produced under the auspices of Revere's Research and Development Dept., "Sheet Metal in Building Construction" documents the principles of sheet metal construction recommended by the company.

From the opening scenes showing a variety of outstanding examples of copper roofs, the focus of the film is switched to Revere's field laboratory in Rome, N. Y., where company engineers and technicians are shown testing various types of installations, both those properly and those improperly designed, as an aid in determining applications of correct principles of installation to roofs, copings, sidings, gutters and flashing. Slow motion photography is used to show the results of proper and improper design.

Although most of the location shots depict copper being formed and installed on the job, the principles illustrated apply to other sheet metals as well and these also appear in the film.

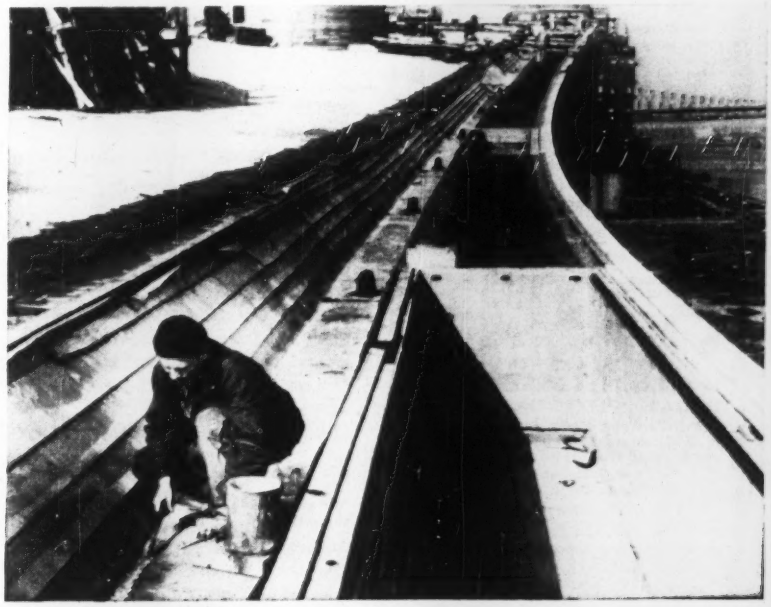
Good Housekeeping— For Men Only

A 13-min sound-color film produced by Aetna Life Affiliated Companies and available from that company's Public Education Dept., Hartford, Conn. A 13-min sound-color film produced by the Aetna Casualty and Surety Co. and available through that company's Public Education Dept., Hartford, Conn. The film deals with safe practices on construction sites.

In Aetna's safety film, "Good Housekeeping—For Men Only," the recommended housekeeping practices for the building industry are woven around the story of a construction superintendent who escapes delays and difficulties by instituting a good housekeeping program.

In scenes from actual construction jobs, the film illustrates correct methods of storing bagged materials, lumber, bricks and explosives; arrangement of storage space; stripping and storing forms; precautions to be observed by workmen and the use of clean-up crews to improve efficiency.

The movie is designed particularly for showing to supervisory personnel. It stresses the theme that "good housekeeping should start with the clearing of the site and end only when the job is done."



GOING ON LOCATION to film Revere's new color movie took cameraman atop the UN Assembly building to record the installation of lead-coated copper gutters.

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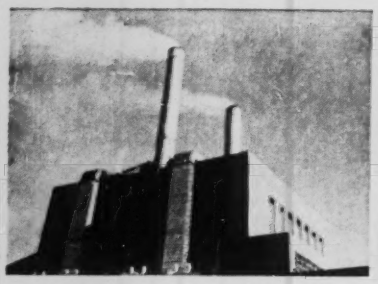

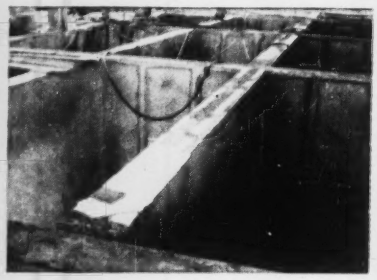

PRECIPITATORS, BREECHINGS, STACKS AND HOPPERS ALL LINED WITH "GUNITE" BY CEMENT GUN CO.

Photos above show units number 1 and 2 of the new 150 m.w. turbo-generator steam electric station of the Pennsylvania Power and Light Company at Sunbury, Pa.

The precipitators, breechings and stacks, visible on the exterior of the building, were all lined with reinforced "Gunite" by Cement Gun Company as were the forty coal hoppers inside the building.

Many instances of repair, remodeling and new construction with "GUNITE" are described and pictured in Bulletin A 2400. A request on your letterhead will bring your free copy by return mail.

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PUBLICATIONS

Roll crushers—A new catalog illustrates the company's line of roll crushing equipment and points out the various advantages of each type, and the particular advantages of the company's product. A section on engineering data gives information that will enable one to compute the recommended speed of rolls, capacity and the size of product and size of feed.—LIPPMANN ENGINEERING WORKS, 4603 W. MITCHELL ST., MILWAUKEE 14, WIS.

Steam generators—A new 20-page condensed catalog covers the diversified line of Union steam generators and allied equipment. Described are eight basic arrangements of two-, three- and four-drum steam generators furnished to meet a wide range of loads, pressures and temperatures for power, process and space heating; Union process equipment including Dowtherm vaporizers. Design drawings and photos are accompanied by brief summaries of salient features for quick reader analysis. Write for Bulletin G.B.-153, UNION IRON WORKS, ERIE, PA.

Water sampling—A new leaflet describes some of the factors involved in obtaining useful samples required for proper control of water conditions in a power house. The literature tells which samples are important, when samples should be taken, where to obtain them and how they should be drawn. Copies of the leaflet, "Effective Water Sampling", (28X7969) can be obtained from ALLIS-CHALMERS MFG. CO., 1018 S. 70TH ST., MILWAUKEE, WIS.

Melting furnace—A Bulletin No. 1081 describes the new Hauck double jacketed melting furnace on wheels. The furnace is designed for melting rubberized joint sealers, such as rubber and plastic, rubber and asphalt, etc. The equipment uses an oil with high flash point as a heat transfer medium; L-P gas is used as fuel.—HAUCK MFG. CO., 124-136 TENTH ST., BROOKLYN 15, N. Y.

Dredging ladders—A 16-page booklet presents the case for Swintek dredging ladders. Sketches take the reader below the water line to show how the traveling chain on the ladder continuously passes over the suction nozzle on the dredge, thus acting as a screen to keep boulders from getting in and clogging up the suction line. It shows how cutter bars on the traveling chain agi-

tate the deposit to increase intake of solids and how these cutter bars hog through clay strata to get at the sand and gravel in rivers and ponds. Many on the job pictures show the types of suction dredges equipped with an Eagle Swintek ladder. Catalog No. 83 is available from EAGLE IRON WORKS, 187 HOLCOMB AVE., DES MOINES 13, IOWA.

Perlite data—New data for the design of efficient roof deck insulation, lightweight floor fill and precast slabs and blocks are contained in a revised mix design chart for perlite concrete. The new mix design information is part of a specification for perlite concrete recently adopted by the perlite producing members of the Institute. A separate specification for the mixing and placement of perlite concrete roof deck insulation that is approved for use under bonded, built-up roofing has also been established.—PERLITE INSTITUTE, 10 E. 40TH ST., NEW YORK 16, N. Y.

Floors—A 20-page booklet describes the importance of good floors in industrial, institutional and public buildings. The result of many years of research in flooring problems, the new brochure explains the differences between floor requirements for various industries. The booklet lists Monroe floor resurfacing and repair products, describes the qualities of each material and recommends the uses to which each should be applied. "Floors" also describes the method of application of each product. Form No. 168-11.—THE MONROE CO., INC., 10703 QUEBEC AVE., CLEVELAND 6, OHIO.

Tractor-shovel—The Hough Model HR 4-wheel drive Payloader tractor-shovel is the subject of a new 16-page catalog. It contains action views of this 1-cu yd machine doing earth and material handling jobs for cities, counties, states, contractors, aggregate producers and industrial plants. Included also are pictures and detailed specifications of all seven sizes of Payloaders. Form No. 255.—THE FRANK G. HOUGH CO., 772 SEVENTH ST., LIBERTYVILLE, ILL.

Vibrating screen—Booklet No. 122-J describes Hewitt-Robins new style J Vibrex vibrating screen. The screen is designed for use in small quarries, roadside contractor's plants, cinder block plants and for building construction jobs.—HEWITT-ROBINS, INC., STAMFORD, CONN.

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EDITORIALS

A Christmas wish

THE WONDER of Christmas is that there is nothing forced or artificial about the atmosphere it creates. Suddenly, without warning, the atmosphere is here, and the world and its peoples begin to think of peace and goodwill as something tangible and attainable. Little troubles seem inconsequential, big ones surmountable. Thoughtfulness and friendliness come more naturally. Charity assumes new importance. Hope for a better world takes on an aspect of certainty. Faith in the future becomes real.

All this, of course, is the Spirit of Christmas. It is a spirit that the construction industry and all who labor in it should savor and cherish to the full. That they may is our Christmas wish for every reader.

The problem of too-costly construction

STEPS taken recently by several building trades indicate that they have recognized the danger of pricing themselves out of the market. Whether or not they have acted in time remains to be seen. In any event, they have set an example that profitably could be emulated by other trades.

The danger sign that installation of a specific material has become too costly is the introduction, followed by growing acceptance, of a substitute. After the substitute appears, generally only the fullest cooperation of the specialty contractors, labor union and material producers involved can prevent serious loss of market, as some building trades have found.

For example, when costs of commercial painting jobs rose too high, a hand roller device for applying paint, which could be used by amateurs, became popular, and a good-sized portion of the residential market was lost to the painters. When costs of setting masonry block and brick got out of hand, substitutes appeared in the form of precast concrete, stainless steel, aluminum, porcelain-enameled steel, asbestos-cement and glass, in combination with various types of insulation. When plastering costs became excessive, dry-wall construction found ready acceptance. These examples are mentioned because the problems they raise have reached a critical stage in the last few years.

One of the most recent efforts to meet such self-induced competition is that exerted by the plasterers. The Contracting Plasterers International Association and two labor unions—the Wood, Wire and Metal Lathers International and the Operating Plasterers and Cement Masons Association—banded together to set up a National Bureau for Lathing and Plastering, to promote the use of plaster. They also agreed to eliminate practices that were keeping costs up, including unwillingness to accept new designs and methods. Real success from such promotion still awaits the appearance of the new cost-saving methods in the plastering field.

The brick industry, facing a similar loss of market, went a step farther than the plasterers and made research the mainspring of its efforts. Through projects sponsored by the Structural Clay Products Institute, new types of brick and new methods of construction are being developed to cut costs. This positive approach already has resulted in growing acceptance of the new products with indications that brick may be on the road to increased utility in many types of structures.

As these two instances illustrate, however, there is no single, simple answer to the problem of a construction group pricing itself out of the market. It may be that time has passed by some materials or methods, and that there is no longer an economic reason for using them. In that case, nothing can be done to preserve them. In other cases, certain practices may have become customary, such as the make-work schemes developed by labor during the depression, that profitably can be eliminated. In still other cases, new forms of a material must be developed, or more economical methods of installation devised.

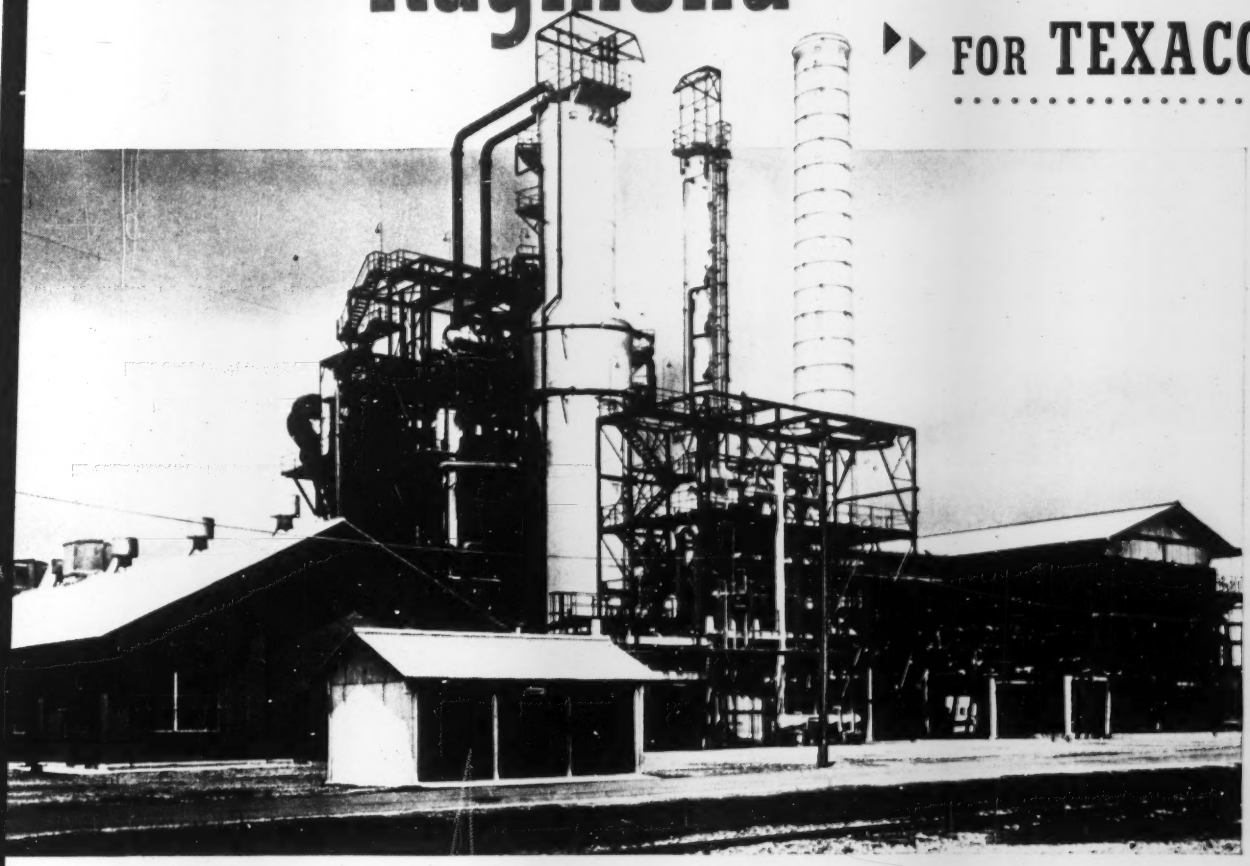
Probably the most important lesson to be learned from these experiences is that development and employment of cost-cutting methods is a continuing responsibility in which the craft unions should play an active part. By supporting promotion and uninterrupted research, they can avoid recurrence of some of the emergencies in which they now find themselves. And they can contribute to less costly and better construction, which is the primary goal of the industry to which they have tied their fortunes.

The questioning mind

AN OBSERVATION that might well be spread in large type on the walls of all research laboratories where young engineers and scientists may read and reflect on it is found in a recent statement by Charles L. McCuen, general manager of the research laboratory division of the General Motors Co. Mr. McCuen said: "In research, as in education, *things* are subordinated to the greater values which spring from the questioning attitude of *people* and their desire to learn. Neither elaborate equipment nor well appointed laboratories can think. These inanimate things make research possible, but creative values from these things can result only from the questioning, analytical minds of men."

In research today the trend appears to be to place great emphasis on impressive physical facilities. This is all to the good, but it is also well to remember that one of the greatest scientific discoveries of all times was made as the result of a man with an inquiring mind watching an apple fall from a tree.

59 MILES OF Raymond PILES... FOR TEXACO



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